School Shop

vol. X no. 6

FEBRUARY, 1951

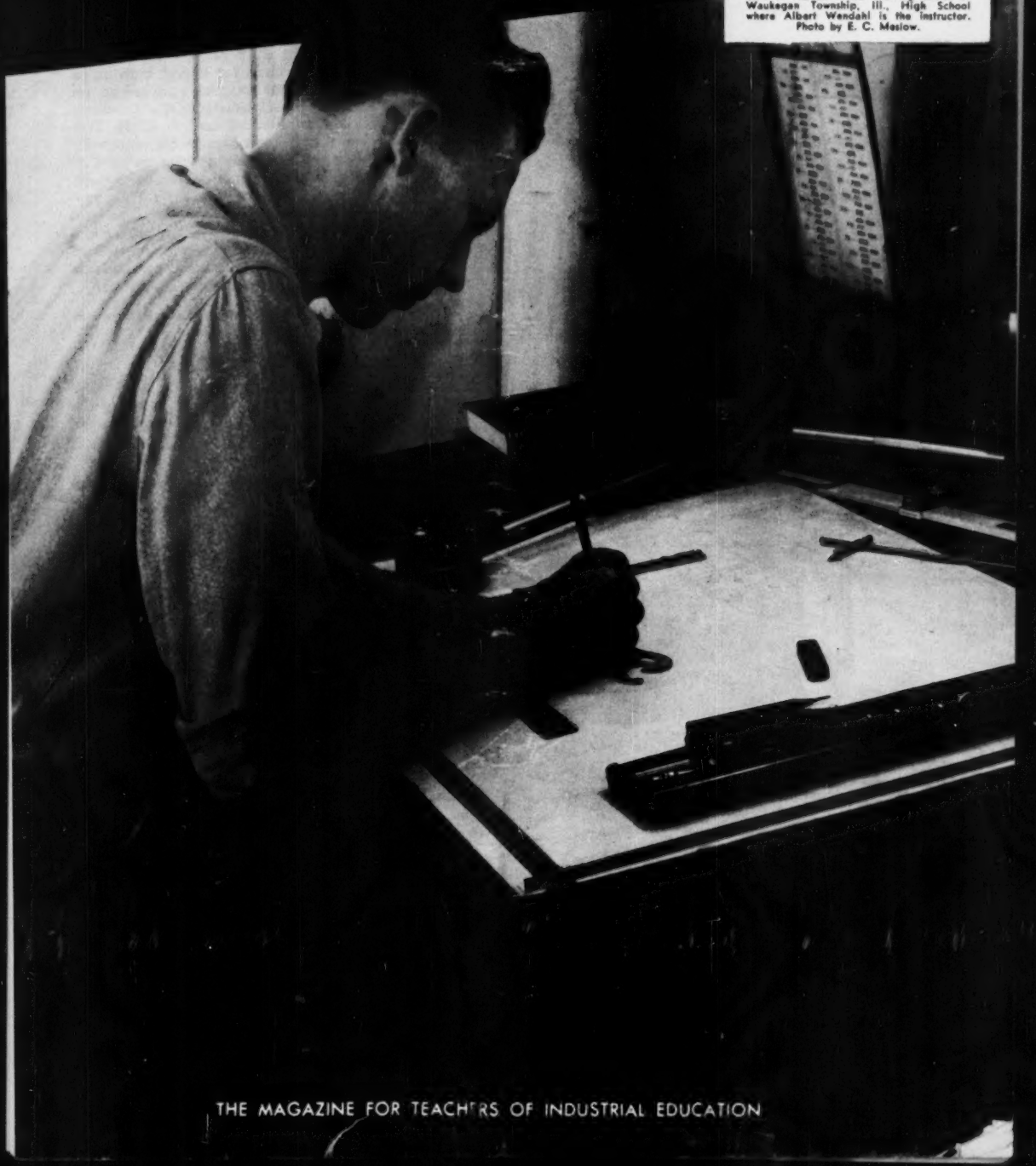
Durham's Special-Education Program
by Henry C. Davis

Aluminum Serving Tray
by Raymond Hofflund

Tool for Turning Archery Shafts
by William G. Johnstone

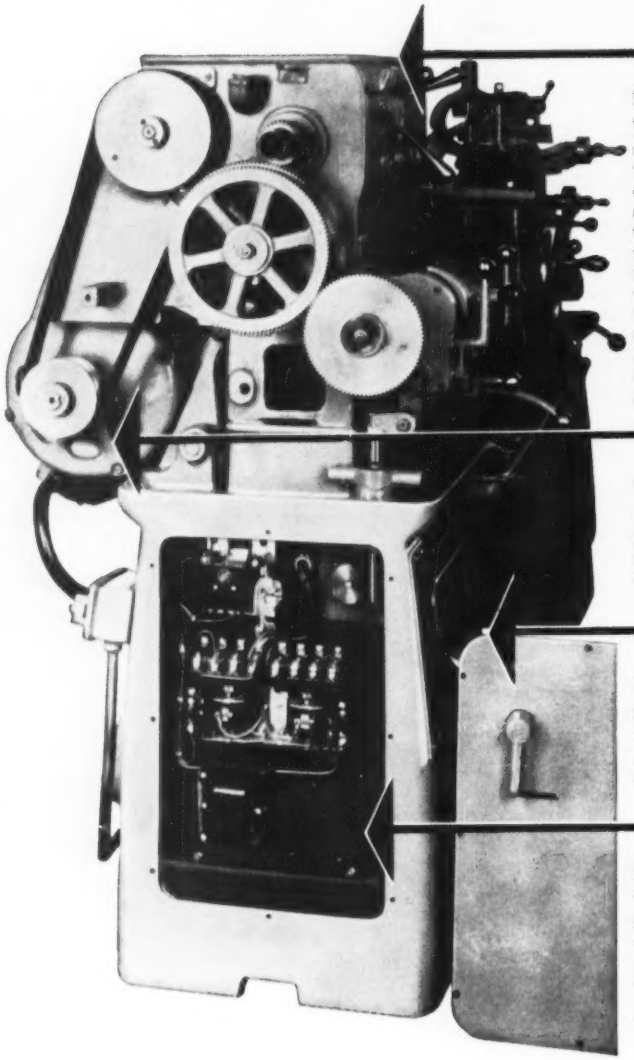
Attractive Coffee Table
by D. W. Lewis

On the cover: Maurice Thompson, a student in the advanced drafting course at Waukegan Township, Ill., High School where Albert Wendahl is the instructor. Photo by E. C. Moslow.



THE MAGAZINE FOR TEACHERS OF INDUSTRIAL EDUCATION

pile it on a tray-top



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School Shop

FOR INDUSTRIAL EDUCATION TEACHERS

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School Shop TALK

COMMENTS ON ISSUES FACING INDUSTRIAL EDUCATION

What About Next Summer?

About this time of the year teachers are likely to be considering the question of what to do during the summer recess from their school duties.

Undoubtedly some will decide to travel; others will find employment with the idea in mind of familiarizing themselves with the latest practice in the field in which they teach; and still others may wish to attend a summer session at a college with a view to securing an advanced degree.

Those who are interested in college work are faced with the problem of selecting an institution to attend. This task is an important one and calls for the consideration of a number of factors, any one of which may be the deciding one.

In the first place, there is the question of cost. Naturally those who are located in an area where there is a college will find it less expensive than attending one situated in a more remote community.

Then there are those who plan to combine study with a vacation. Naturally enough this limits the choice to colleges situated in areas where vacation facilities are available. This is a worthwhile consideration as it enables the teacher to spend the necessary time in class while at the same time his family may enjoy the customary activities associated with a summer holiday.

Again we find that some teachers have in mind a specific phase of their work they wish to explore. This means that the choice of a college is limited to those in which the opportunity is available.

The policies regarding the transfer of credit vary in different institutions and, naturally, the teacher who is looking for the most advantageous entrance shops around to find out where his education and experience will be given the highest valuation.

More important than any of these, perhaps, is the question of the faculty responsible for the work in the college being considered. Discerning teachers recognize that there are college teachers who enjoy a nation-wide reputation in their fields. To those who are conscious of this fact, the governing factor in their selection of an institution may be the individual under whom they will do their college work.

All of these situations enter into the thinking of most teachers when they are considering the problem of summer study. Obviously it is not possible in every case for a teacher to satisfy his specific desires. Pressures of various kinds tend to make him modify his ideas, and force him to base his choice on the basis of some factor which, in other circumstances, he might feel was relatively unimportant. In general, it is suggested that the following order might be worth considering when a choice has to be made.

1. Does the college offer the specific thing you want?
2. Are the facilities at the college adequate to provide what you want and need?
3. Does the faculty have a standing in your field which will command the respect of others in education?
4. Is the college located in an area in which your family may enjoy a vacation while you study?
5. Are you likely to receive satisfactory credit for your education and experience?
6. Is the cost within your financial means?—*T.D.*

Democratic Beginnings

At Cincinnati the American Industrial Arts Association and affiliated organizations changed their constitutions to make them more democratic by calling for mail ballots for officers from all members.

For our money, this is a move in the right direction. Too many of our professional organizations have their programs and policies dictated by a small clique of mostly self reappointed leaders who make all the decisions. These people, almost invariably, have the interests of the profession at heart and lead the group accordingly.

Nevertheless, the rank-and-file member is seldom consulted and seldom can make his voice heard if he feels so disposed. He is apathetic, as a result.

Our guess is that it will take some time before the rank and file will realize that their voice is potent and can be heard. The inertia of years of nonparticipation will be hard to overcome. In the meantime, other technics should be developed to foster more active participation by the membership at large in professional organizations.—*L.W.P.*

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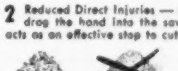

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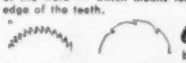

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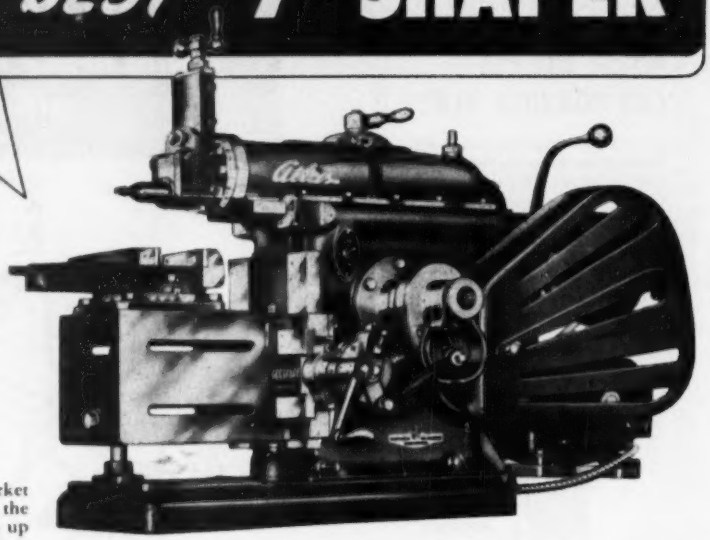

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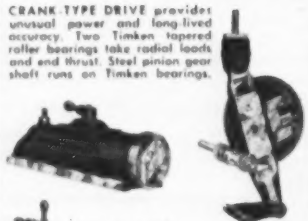

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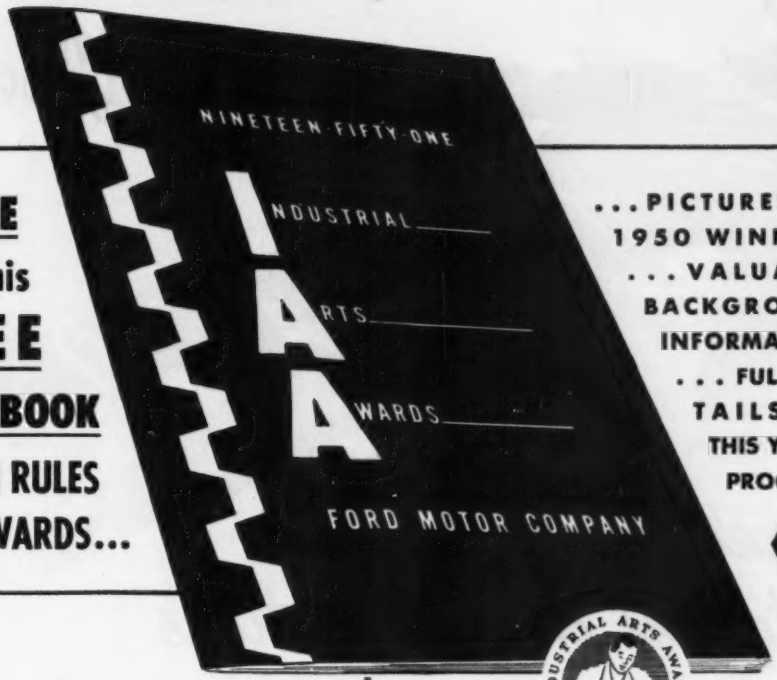

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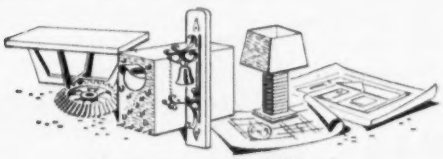

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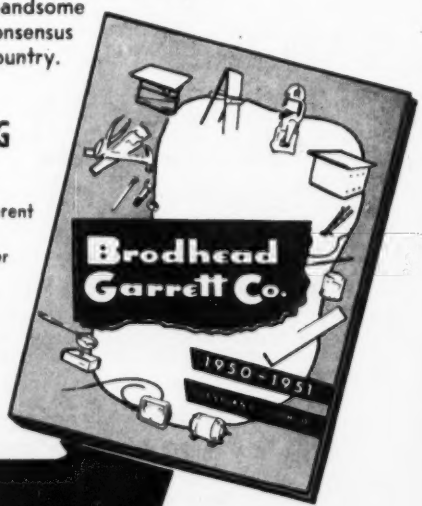

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"EVERYTHING IN INDUSTRIAL ART SUPPLIES"

Durham, North Carolina's

Special-Education Program

By Henry C. Davis

Here is an account of how one city's schools are meeting the problem of what to do with youth who are, for one reason or another, not adjusted to the regular school curriculum. Henry C. Davis is an instructor in special education at Carr Junior High School, Durham, North Carolina.

THE special-education program, such as we have at the Carr Junior High School and East Durham Junior High School, are phases of North Carolina's state program of special education for exceptional children. Although the state has sponsored special classes for defective speech, defective hearing, defective sight, cerebral palsy, etc., for some time, the classes such as we have here in Durham are new in the field, the first one in the state being started at Carr Junior High School two years ago and the second one at East Durham last year.

These classes, on the junior-high-school age level, were organized for those boys who, for various reasons, are beyond their age-grade level, for those who have not done too well in their regular grade class work, and for those who are waiting only to reach the age of 16 when they can quit school.

To keep these boys active in school and to get them interested in something that might influence them in the wise choice of an occupation in later life are the primary objectives of the program. The classes are organized so that the student spends approximately one-half of his time in the shop doing regular shop work in wood, metal, electricity, plastics, etc. The other half of the time is spent in basic academic classes such as English, arithmetic, history, geography, and health. The class also has two gymnasium periods a week, one period of art, one of music, and one in the library. *In fact, this class has more different activities than any other class in the school.* These activities, aside from their cultural value, have a socializing effect on the student and give him the feeling of belonging.

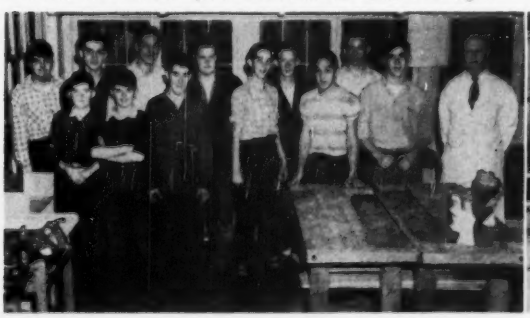
The shop is well equipped with both power machinery and hand tools for 20 students. The classroom, which is also used for drawing and planning, is separated from the shop by a glass partition. The shop work is conducted somewhat differently from the regular industrial-arts classes in that the student is permitted a great deal of freedom in the choice of his work. He is not required to do certain practice exercises or projects and can remain in one area, such as metal, as long as he continues to show interest and does the best work he is capable of doing. It is hoped that these experiences will influence him in the choice of a vocation.

In spite of opinions to the contrary, there is an opportunity and a future for these boys. They may return to a regular grade any time they are capable of doing the work of that grade; they may go into a high-school vocational class when they reach the age of 16; or they may remain in the special-education class indefinitely. They are not turned out when they reach 16 just because of their age. Some of the boys show marked ability in certain lines. From a manipulative viewpoint, they are the equal of the average industrial-arts student of comparable age. Almost all of them are interested in the class, take pride in the shop, and have done a great deal of the work required in fixing it up.

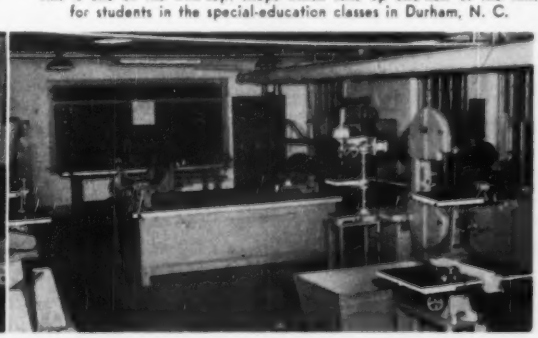
The writer wonders if the philosophy that all men are created equal can be accepted literally by the modern teacher. We are not created with equal mental and physical abilities. If students are not on a comparable intellectual plane, they will not react in the same manner to different experiences. Why then should they all be required to take the same courses? We must make the schools to fit the needs of the individual rather than the needs of the masses; we must teach the student only what he has the ability to absorb; and we must teach them what will be of direct value to them.

We are not overrating the possibilties of our special-education classes. We do not expect to make college presidents nor captains of industry out of these boys; however, we do hope to make good honest citizens who realize that any honest labor is honorable and in the accepted American tradition. If we can do this, then the class will have fulfilled its purpose. It would seem there is a desperate need and a great future for such classes.

No dead-enders here. These are typical of the enthusiastic youngsters in Durham's classes in special education. The author is at right.



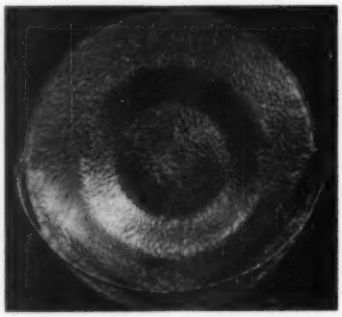
This is one of the well-kept shops which take up one-half of the time for students in the special-education classes in Durham, N. C.



Students Choose This Aluminum Serving Tray

By Raymond Hofflund

Art metal work is becoming increasingly popular in school shops. This should be encouraged as it provides opportunities for creative work which is new to most students. The author of this article teaches in the Ventura Junior High School, Ventura, California.



When a pupil takes home a tray like this, it does much to raise the prestige of industrial arts in the minds of parents.

"CHOICE" is the expression used by students when indicating their approval of this attractive serving tray. The beautiful lines and flared edges, made by the chasing tool, make this project appeal to them. This approval simplifies the teaching of the many operations involved in its construction. Among these operations are cutting with the squaring shears and with snips, using emery cloth, buffing with tripoli and rouge compounds, using layout tools, peening, forming with rawhide mallet, annealing, chasing, punching, drilling, filing, and riveting.

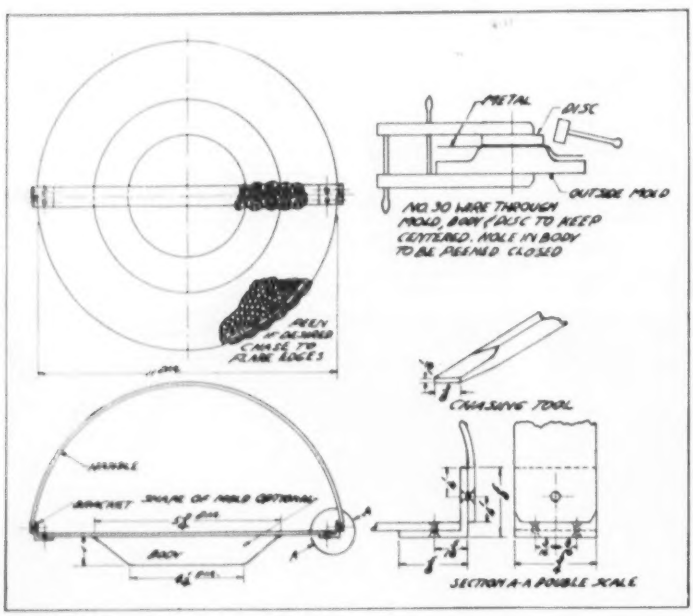
The manipulative work involved in these operations opens the way for the presentation of a wealth of related information. This includes the study of metals suitable for art-metal work, types of finishes, kinds of buffing compounds and emery cloth, kinds of hammers, heat treating of metals, kinds of rivets, etc.

Although the choice of metal is optional, 3 S-O aluminum seems to be preferred over others. This may be attributed to the low cost of the material, to its working qualities, or because it looks expensive when the job is finished.

To insure a satisfactory finish, all scratches should be removed before peening if a peened surface is to be used. Peening hardens the metal and, for this reason, it is necessary that the metal be annealed at frequent intervals if uniform peen marks are to be obtained. When forming on the mold, a rawhide mallet can be used to avoid denting or scratching the metal.

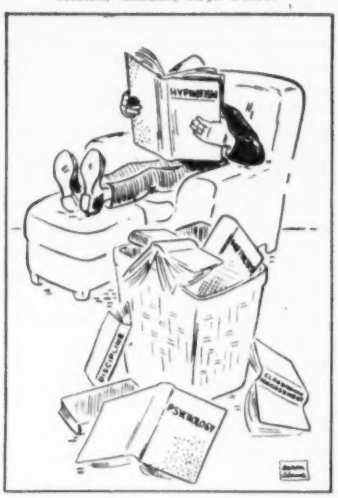
The handle, which is 17" long, is fastened with eight- or ten-ounce countersunk head rivets.

A satin finish may be obtained, if desired, by rubbing the tray with liquid soap and steel wool.



Jigsaw Jones

By Aaron Adams
Marion, Indiana, High School



Announcement

THE April, 1951, issue of SCHOOL SHOP will be a special number on "Methods in Shop Teaching." For the first time in the history of the profession, the major portion of a special issue will be devoted to the latest developments in teaching shop subjects.

Articles will be by experts in their various fields and will cover each area of shop teaching including the general shop. Don't miss the April Methods and Directory issue!

Our Greatest Need: Up-to-Date Teaching

By Arthur A. Dick

No shop teacher can be called modern unless he examines his program once in a while, says the author. Supervisor of Vocational Education and Industrial Arts in the Baltimore County, Md., Schools.

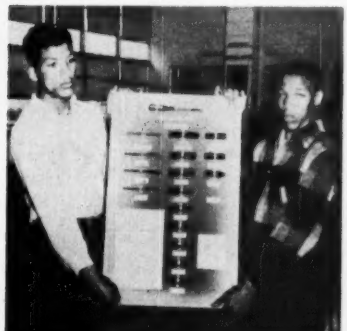
ARE you teaching the same way you did ten years ago? You are if your philosophy, objectives, courses of study, subject-matter offerings, teaching methods, and project material have not changed in that time. If any or all of the above-listed factors are unchanged, the chances are that you have not made much progress as a teacher and that your job is a static one.

The success of the superior teacher is due to many factors, including personality, interest, know-how, an understanding of pupils, and an awareness of the necessity for change. To teach the same course the same way year after year makes for monotony and plateau teaching and causes the interest factor to decline for both teacher and pupil. Generally the teacher who believes in change, experimentation, and in trying out new ideas is the happy teacher. He is continually projecting and planning for the future. He is an optimist, is alert, and he believes in positive thinking. His enthusiasm and interest are contagious to the pupil.

Projects

Progressive teaching can make itself manifest in a variety of ways. For the shop teacher, projects are a natural outlet for the progressive spirit. The project can be a means for developing skill and for learning theory through practice. There are individual and group projects of many varieties and each one involves a plan or scheme. The project may be carried out in or out of school. It may be a visual aid, a scale-model home, a garage, an exhibit, or repair work on an automobile.

Project panels are in evidence in the up-to-date shop. Here are students in the Baltimore County schools with a well-made screwdriver project panel.



The project need not be restricted to working with tools and materials. For example, a related class in vocational English might proceed as follows: students make up a spelling list of words taken from oral and written usage in the auto-mechanics shop; then learn both proper spelling and proper usage of these words.

Safety and other topics can be taught by similar technics, through conferences, and through other methods which utilize what group dynamics teaches us. Collecting home plans from magazines for a notebook can be a worthwhile project in architectural drawing.

Correlation can come about in general metal shop, for example, through instructing the pupils to plan and make working drawings and sketches in drawing class for later use in constructing projects in the shop. Thus, the drawing class might make the drawing of an aluminum casting for a lathe pulley. The woodshop might make the pattern, and the machine shop complete the project by pouring the casting and doing necessary machining afterward.

Program

The progressive school system has basic courses of study but it revises them in the light of experience from time to time, with teacher participation. All offerings should be based on pupil needs as determined through survey. We should help the pupil prepare for life.

In a typical community industrial-education offerings might be scheduled as follows:

a) Junior-high-school industrial arts should be generally exploratory in nature. Subject-matter areas might be graphic arts, wood, metals, ceramics, plastics, leathercraft, electricity, etc.

b) Senior-high-school industrial arts should consist of such specific areas as drawing, woodworking, machine shop, auto mechanics, printing, electricity, etc.

c) Vocational subjects might be sheetmetal, carpentry, machine shop, bricklaying, etc.

It should be pointed out that these offerings at different levels in the school should be based on a realistic appraisal of community job opportunities and the expected school-termination age of the students. In industrial education, a judicious blending of job-preparatory and life-preparatory programs can be made. The progressive school system will work constantly toward this end.

The alert shop teacher should see what the other fellow is doing and make comparisons on the basis of what he observes. He should keep abreast of trends through professional literature, meetings, further schooling, visits, and work experience. There are other means which the teacher can find for picking up information and new ideas.

Many of us are too inclined to think,

(*Continued on page 21*)

What Is Up-to-Date Teaching?

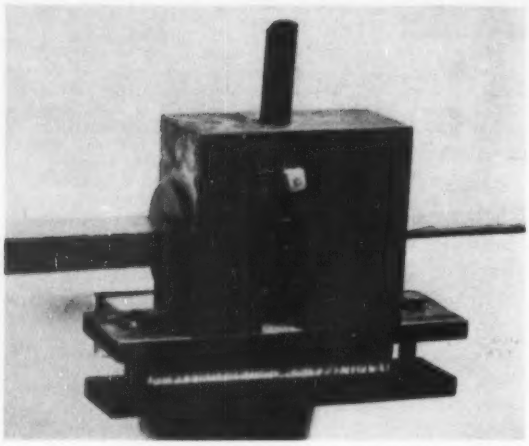
FOLLOWING is a partial list of what might be found in a shop where effective, up-to-date teaching is going on.

1. *Project panels* are in evidence.
2. *Visual aids*—mock-ups, models, samples, charts, motion pictures, and slide film are used.
3. *Pupil personnel organization* is complete and it is functional.
4. *Color dynamics* is used to advantage and harmony in arrangement is stressed.
5. *Conservation-consciousness* is in evidence in the students' attitudes toward materials.
6. *Good shopkeeping* is evident.
7. *Bulletin boards* are changed frequently and are always relevant to the program.
8. *Blackboard drawings* and writings change at suitable intervals and are also relevant.
9. *Safety* is constantly taught and practiced.
10. *Project material* changes frequently and projects are used for planning and learning.
11. The *basic course of study* does not interfere with initiative of students.
12. Effective teaching goes on because of *adequate class control.*
13. Teachers attend *professional meetings,* belong to *professional organizations,* and read *professional literature.*
14. The teacher understands *group dynamics* and applies it to shop situations.
15. Definite *checking points* are established in the scheme of teaching.
16. Teaching is *organized.*
17. *Objectives* are set up and the program is constantly surveyed for signs of progress.
18. Teachers teach *what students need* and at the speed at which they can assimilate it.
19. There is *opportunity* for experimentation and new ideas.
20. Provision is made for *work experience* outside of school.
21. *Exhibits* are recognized as good public relations and are encouraged.
22. There is a *guidance* and *follow-up* program.
24. *Progress charts* are kept up to date.
25. Suitable *shop records* are kept and are used in formulating judgments for future action.

Tool for Turning Archery Shafts

By William G. Johnstone

Students in advanced machine shop will find this an intriguing project. The physical education department will welcome a source for making arrow shafts in the school. William G. Johnstone, teaches machine shop at the Newton Trade School, Newtonville, Mass.



This turning tool rests on the tool-post slide of a standard engine lathe.

ARCHERY is gaining in popularity as a sport and many high-school youth participate in it. This project was designed to enable the enthusiast to turn his own shafts. Much can be learned about some of the advanced machining operations by the student who makes this device.

The tool is quite simple as shown by the drawing. It consists of a rectangular block of cold rolled steel, although cast iron could be used.

A slot ½" by 1½" is milled through the block as shown. The center distance from the base to the 1-⅛" hole where the bronze bushing runs will be determined by the distance from the top of the lathe tool-post slide to the center of the lathe spindle. On the lathe this tool was made for, the distance is as shown on the drawing. The 21/64" hole must be on center with the 1-⅛" hole, as the former acts as a support for the shaft as it is turned.

The drawing shows a 5/16" square hole for the high-speed steel tool bit used to turn the shaft. This hole may be round to simplify making the tool. I made a set of broaches for cutting this square hole. The hole was finished first and then I mounted the bushing on a square mandrel to turn the other diameters.

If your shop is not equipped to make broaches, you may drill a 9/16" hole in the bushing. Then file the corners of a square in the hole so that a piece of ½" square stock will slide through. Turn the outer diameters concentric with the hole.

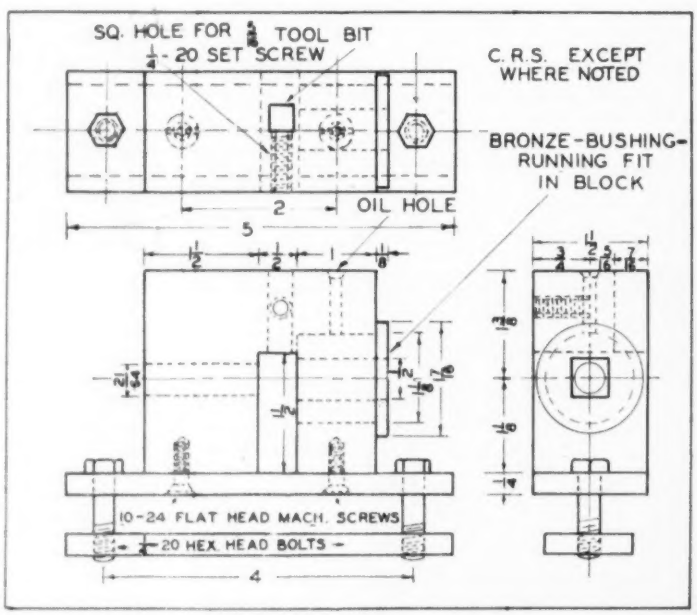
The ½" square hole must be exactly in the center of the bushing.

The two pieces of flat stock shown on the base of the block are used to secure the tool on the tool-post slide of the lathe.

The tool bit should be ground with about 25° top rake and about 15° clearance. With these angles, the tool will produce a very smooth finish. I have found it simplified the adjusting of the tool bit if a gage is made from a piece of ½" square steel which is turned on the end to the size of the finished shaft. This gage eliminates the cut-and-try method of adjusting the tool bit after regrinding.

The stock for the shafts should be cut into pieces ½" square and 4" or 5" longer than the shaft is to be finished. The extra length is to allow for holding the shaft in a chuck or collet for turning. The shaft, when turned, will be absolutely straight and should be shellacked immediately to retain straightness.

While this tool was designed primarily to turn archery shafts, there are many other turning jobs where a similar tool could be used. Dowels can be made readily by substituting bushings of the desired sizes.



English Colonial Wall Sconce

By Harold O. Akeson

This author, who teaches in the high school in East Orange, N. J., presents a project which is both attractive and useful. It has the added advantage of including a number of processes common to metalworking such as laying out, hacksawing, peening, drilling, bending, riveting, and forming over a wooden form. With the limited time available in the general shop, this variety of processes in a single project is an asset.

THIS wall bracket, of English Colonial design, was borrowed from an old wall candle sconce, and is made from material which is inexpensive and easily obtained. Although the project may look difficult the processes involved are really quite simple. As an aid in shaping the parts it is suggested that a full-size drawing, on either heavy paper or cardboard, be made.

Start the project by making the back piece first. Select a piece of band iron $\frac{1}{8}$" x $1\frac{1}{2}$" x 15". Next cut a 3" slit down from one end with a hacksaw. To form the V opening at the top, place flat side down in a machinist's vise, and bend a little on one side and then the other, alternately, until the desired shape has been obtained. Now flatten the three ends of the iron to a chisel point with the face of a ball-peen hammer, and then file off any irregularities. Hammer mark the metal on both sides with a ball-peen hammer. The edges are marked with a cross-peen hammer.

For the scroll support, select a piece of band iron $\frac{1}{8}$" x $\frac{1}{2}$" x 11". Flare the ends, as on the back piece, and hammer mark the surfaces. Shape the scrolls, making one scroll smaller than the other.

The bending of the metal is done cold. A U-bolt, or a monkey wrench, clamped in a vise can be used as a bending jig. Make many small bends close to each other, and test the curvature frequently by placing the iron on top of the full-size drawing.

The remaining piece to be made is the drip pan. This is made from a piece of 18 gage stock $4\frac{1}{4}$" x $4\frac{1}{4}$". Find the center of the piece and scribe the two circles, one $3\frac{1}{4}$" and the other $4\frac{1}{4}$" in diameter. Divide the $\frac{1}{2}$" space between the two circles into ten equal parts for the scallops which will form the supporting side of the drip pan. Cut out the scallops with a jewelers' saw. File the edges smooth and bend over on a round maple disc $\frac{3}{4}$" x $3\frac{1}{4}$" in diameter.

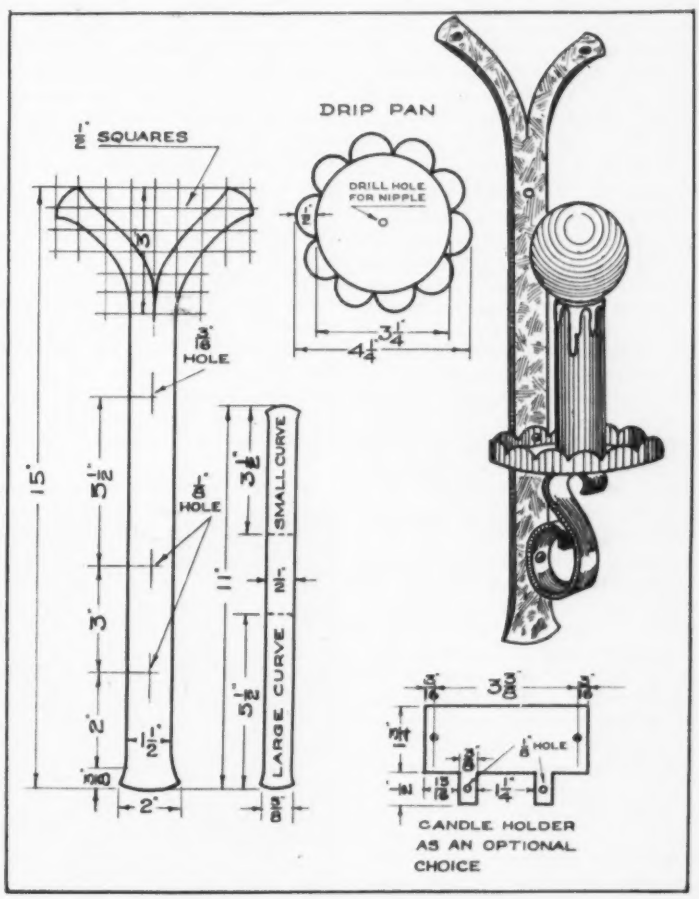
If a candle holder is preferred, instead of an electric candle socket, select a piece of 18-gage black sheet iron $2\frac{1}{4}$" x $3\frac{3}{4}$". Lay out, cut to size, and form on a 1" maple dowel. The two lugs should be bent at right angles to the holder.

At this point it is convenient to drill all the holes preparatory to assembling. Spot and drill two $\frac{1}{8}$" holes near the bottom of the back piece to hold the drip pan and scroll in place. The next hole, further up on the back piece, is 3/16", and is for fastening the bracket to the wall.

On the scroll support, locate and drill two $\frac{1}{8}$" holes. One of these is on the large curve and should correspond with the bottom hole on the back piece of the bracket. The other hole is on the small curve directly under the drip pan. Another hole to be drilled is the one in the center of the back scallop, corresponding with the $\frac{1}{8}$" hole which is second from the bottom of the back piece. Also drill a hole in the center of the drip pan for a $\frac{1}{8}$" brass nipple.

Candle sockets may be bought in standard lengths and fastened to the drip pan with a $\frac{1}{8}$" brass nipple and lock nut. The lamp cord, preferably black, could be led out of the drip pan to a hole drilled through the back piece to fit wall connection. (Drill this hole before assembling parts.) Control of circuit may be by a wall switch or individual lamp toggle switch. The bulb may be either round or flame shaped.

After assembling all parts, finish with a flat black lacquer. When dry, highlight the work by rubbing with steel wool. Polish with wax.



Why... the Composite General Shop?

By H. H. London and Merton C. Wheeler

Modern industrial products require various processes and materials and so should the modern school shop say the authors. H. H. London is Professor of Industrial Education, University of Missouri, Columbia, and Merton C. Wheeler is State Supervisor of Industrial Education for Missouri.

AS EVERYONE knows, there is no such thing as a balanced diet consisting wholly of potatoes! Neither is it possible to offer a broad and well-balanced program of industrial arts in a single shop confined to woodwork, metalwork, or any other one activity. If industrial arts is to interpret industry to youth, to provide exploratory experiences and consumer values, and to develop basic skills and understandings in the care and use of common tools and materials, then its content obviously must include a wide variety of fundamental experiences, representative of industry as a whole.

About the only way the small school can provide this type of industrial-arts program is through the medium of the composite general shop. The composite general shop is not three or four shops in one, but rather a type of shop organization in which the subject-matter experiences have been selected from different phases of industry on the basis of student interest, relative importance, and suitability for school purposes with all activities organized into a unified program. Many of the older unit-type shops are being converted into composite general shops, and many schools which heretofore have had no shopwork are establishing shops of this type.

Although the composite general shop includes equipment and materials for several different types of work, it is not an expensive shop to set up and operate in comparison with the unit-type shop. In the unit-type shop, where all the experiences are "stacked up vertically" in one area, costs may run up rather quickly because more advanced equipment and more elaborate and expensive materials are necessary if students are to be kept profitably engaged for sustained periods of time. On the other hand, in the composite general shop, where the experiences are "spread out horizontally," the work can be confined to the more elementary processes, especially in the beginning courses, thus minimizing the necessity of getting into more expensive materials and equipment.

The composite general shop here illustrated contains tools and equipment for bench and machine woodwork, wood finishing, sheet- and art-metal work, applied electricity, bench-metal and machine-tool operations, forging and heat treatment, casting or foundry work, gas and electric welding, plastics and leathercraft, and drawing and planning, all of which are an integral part of the shopwork. The shop room illustrated is 29′ by 63′ giving a total of 1827 square feet of floor space. The shop will accommodate classes of from 25 to 30 students in general shop. Courses in woodwork, metalwork, and drawing can be offered in the shop to groups of from 10 to 15 advanced students. The prewar cost of all tools and equipment, exclusive of four war-surplus machines, was $5,095. The machines are small, though sturdy, and most of the money was properly spent for hand tools and bench equipment. It would cost approximately $8,000 to $10,000 to equip a similar shop at current prices.

Some shop teachers object to the composite general shop organization on the ground that it is too difficult to operate. And it is difficult for the instructor who insists on using unit-shop technics and procedures. The composite general shop calls for a different approach in teaching. The teacher must be resourceful and willing to tackle new things. Well-organized instructional materials are essential and much individual instruction must be given. Ideally, the projects should "cut across" several areas of work, and, of course, they should be useful objects and well designed. The lamp, which the boy in the picture is making, involves designs and planning, bench woodwork, turning and finishing, art- and bench-metal work, and electricity, all vital and interesting industrial experiences.

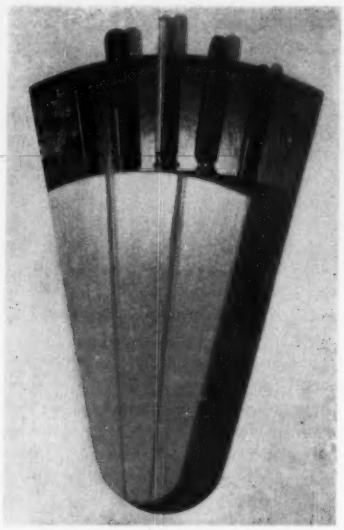
Making this lamp involves a variety of experiences for the student in many areas of work.

One thing is certain, if the student's projects are chosen wisely and well-planned, if the shop is properly supplied with equipment and instructional materials, and if his teacher is competent, the boy will obtain richer and more interesting experiences than he would get in the unit shop confined to one activity. Just as hybrid corn has proved to be superior to common corn, so the composite general shop is superior to the old-fashioned unit shop. The schools of America need more and better composite general shops to train youth as intelligent consumers, producers, and citizens in an industrial economy.

(EDITOR'S NOTE: This article is reprinted by permission from *Missouri Schools*.)

A composite general shop such as this one does not require an exorbitant financial outlay.

Parents Like This Knife Rack



A good finish adds to the attractiveness of this project for beginning shop students.

By James B. Lidstone

For classes in elementary industrial arts this knife rack can serve as a good take-home project as well as a means for teaching the use of various hand and machine woodworking tools. James B. Lidstone teaches at the Edward Devotion School, Brookline, Mass.

TESTED 55 PROJECT

THIS project may serve as a means of teaching the use of the band saw or jig saw and the disc sander or it may be made with hand tools. The student will have a better understanding of the terms radius, tangent, and segment if a full-size layout of the front block is made on the back of the knife rack. Industry makes use of the full-size layout quite often and the importance and convenience of such a procedure may be emphasized.

Actual size patterns or templates may be used in place of having each student make a layout.

The front block may be made of scrap stock that accumulates in every shop so a lesson on glueing and clamping is a possibility.

A suggested method of procedure:

1. Layout and cut back board to size using band saw and disc sander.

2. Make a full-size layout of front block on the back board.

3. Bandsaw and sand front block to size. Place block on full-size layout to check size and shape.

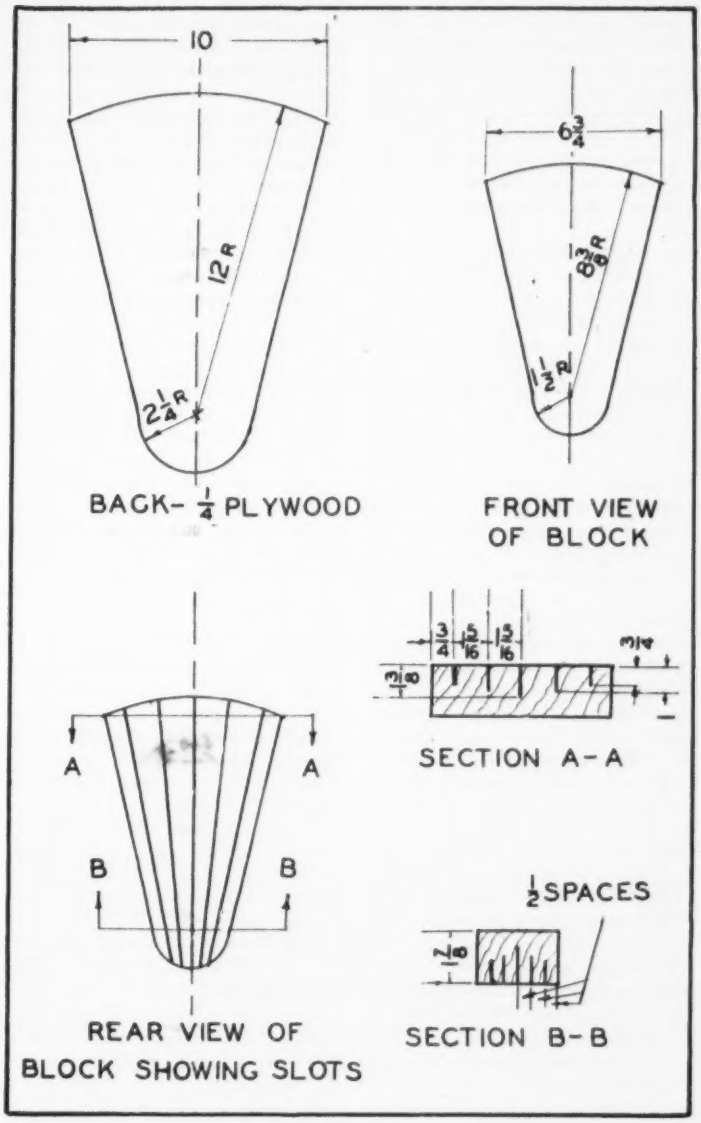
4. Layout knife slots on back side of block and project these lines on each end of block.

5. Cut knife slots using circular saw and a sliding gage board that runs in cross-cut gage groove. Check depth of saw cut on scrap stock before making cuts on front block.

6. Hand sand the back and front block. Assemble with ¾" No. 4 flat-head screws.

7. Apply a wash coat of shellac. Sand the shellac coat when dry and apply two coats of enamel paint.

The front panel of the block offers a good surface for a decalcomania transfer or V-shaped grooves, running vertically, may be cut in the front panel.



Finding and Selecting Potential Industrial-Arts Teachers

By Carl E. Frankson

Procuring good teachers is a major responsibility of our teacher-training institutions. Here is a description of how this activity is carried on at the State Teachers College, Newark, N.J. by the chairman of the Department of Industrial-Arts Education at that institution.

ONE of the major problems of teacher education is that of teacher recruitment and selection. This is especially true in the area of industrial-arts education. Educators have long been conscious of this problem but it has not been until recently that concerted attention and action has been focused on it.

When Calvin Woodward introduced woodworking into the public schools of St. Louis in 1873, the teachers were recruited from industry. The majority of men who entered this fast-growing phase of education were craftsmen of outstanding ability, but they lacked the necessary academic and professional preparation for teaching. Perhaps this was natural because the early emphasis was placed on preparing boys for vocations.

In 1905 Bonser advocated the addition of the phenomenon of industry to the shop curriculum. Little progress, however, was made along this line until World War I. The teaching of tool skills continued to be of more importance than bringing about behavioristic changes which would aid individauls in adjusting to the cultural patterns of society. When our society was composed of small communities and farms, and was mostly rural in character, this type of teaching in the shops was perhaps justified.

Industrial changes had been occurring since the advent of the industrial revolution, but most people were not seriously affected until the turn of the century when industry became more concentrated. New products of industry such as the automobile, the telegraph, the radio, and the airplane had a pronounced influence on all education and especially on the shop programs of our schools. First-hand experiences in producing the products which we were to consume were no longer possible for the majority of children in our schools. The function of the shop program now changed from predominantly skill training to one of much broader experiences which included the interpretation of industry.

The recruitment of teachers for the manual training, and later the manual arts periods, was relatively easy. A townsman of good character who had a broad background of vocational skills, preferably in one trade, was employed to teach that area in the public schools.

The recruitment of teachers for the interpretation-of-industry aspect of the school shop program has become increasingly difficult because of the broad academic and technical training required. Most of the elementary, junior-high, and senior-high schools of the nation are small in pupil enrolment and are located in relatively small communities. This statement infers that in most of these schools only one industrial-arts laboratory is to be found. The program, therefore, is very general in character, embracing many representative areas of industry. The very nature of the program demands a teacher who is intelligent, resourceful, and one who understands not only tools, materials, and processes, but also one who understands children, their needs, wants, and potentialities. He must also be well versed in pedagogical techniques so as to present a program which interprets industry in such a way as to bring about the orientation of individuals in a society characterized by technology.

Action Essential

Teacher recruitment can no longer be left to chance if educational institutions are to produce citizens for the democratic way of life. Teacher-preparation institutions must have active programs of recruitment and selection if desirable people are to be induced to enter the teaching profession.

What are the qualities desired in individuals who are recruited for teaching industrial arts? It appears evident that no one person is able to list all of the qualities which would be agreed upon by all educators. However, it appears that most people would agree to certain general qualities which are required.

One of the first considerations must, by necessity, be intelligence. The person recruited does not need to be a mental genius, but should possess above-average intelligence. Leadership infers intelligence. Intelligence is necessary in organizing and implementing a functional program of industrial arts.

Health is another fundamental consideration in recruitment. The person who works directly with children should possess a healthy and strong physique, free from contagious diseases. Teaching requires vitality and stamina. The person equipped with these qualities can serve as a model and inspiration for youth.

The prospective teacher should represent the best type of citizen in the community. He should be interested in, and should participate in, those civic activities which lead to community health and social and cultural growth.

The individual recruited should have a deep love for, and understanding of, children. All individuals are unique. No two individuals have needs and problems exactly alike. There are those who can express themselves adeptly in language while others may express themselves through such media as paint, music, ceramics, wood, and metal. Children must be understood and treated as individuals, each with his own background and his own interests and curiosities to be satisfied. Directed learning must reflect these differences if the essential democratic ideals of respect for the worth of the individual are to be realized.

Other qualities which the individual should possess are industry, integrity, sincerity, morality, honesty, ingenuity and a willingness to devote his energies to a profession which in the past has yielded little remuneration.

How to Recruit?

What techniques may be used in recruiting the prospective teacher? One of the most effective is that of college officials working directly with the in-service industrial-arts teachers. When these teachers have found high-school boys who have the desired qualifications for teaching, they contact the chairman of the college industrial-arts department and he in turn asks the school for permission to arrange an interview with these boys. The teacher has had direct contact with the students and has had the opportunity to study them under all types of circumstances. This type of recruitment could well begin in the

The author interviewing Robert Dello-Russo, a prospective teacher of industrial arts. (Photos by Herbert Sacks.)

Entrance examinations are taken by students wishing to major in industrial arts at Newark State Teachers College.

junior year of high school.

Another technique which could be used is that of sending two or three of the college industrial-arts majors out to the communities to speak to interested high-school boys. These men could explain the college and its functions on an informal basis. Pictures showing laboratory work, sports, social activities, and general college life may help in interesting the recruits in the college curriculum.

Colleges could invite high-school seniors to spend at least one day on the campus as guests of the college. Industrial-arts majors could be appointed to serve as guides and hosts. An invitation to attend some social function may well serve as a special inducement for some students.

The directors of guidance in the high schools of the nation should not be overlooked by the recruitment officers of the colleges. These individuals often have elaborate data concerning all high-school personnel. A friendly understanding between these directors and the industrial-arts chairmen of the colleges can do much toward interesting and recruiting the individuals who have the desired qualifications to become industrial-arts teachers. The techniques mentioned are but a few which may be used in a program of recruitment.

Selection

Recruitment is but the first step in the total program of securing and preparing industrial-arts teachers. Once individuals have been recruited, the process of selection should take place. Selection should be continuous from recruitment to certification.

Several states now have outstanding recruitment and selection programs for securing the finest possible industrial-arts teachers. Among the best perhaps are those found in Ohio, Minnesota, Connecticut, New York, and New Jersey. The programs in these states have a great deal in common, but vary a great deal in techniques in attaining the desired results. Perhaps by analyzing one of these programs a clearer picture may be had as to how the program of selection functions. It may be assumed that recruitment has taken place previous to the selection process as discussed.

The New Jersey State Teachers College at Newark has had an active program of industrial-arts recruitment and selection for many years. During the depression, a quota system was established limiting the number of entrants. This system is flexible and is governed by supply and demand.

The individuals who wish to pursue the industrial-arts curriculum must first secure an application form from the college registrar. Only the upper half of any graduating class is considered for registration. The applicant must also present evidence of good moral character, health, and scholarship. Evidence of moral character is usually provided by letters which are written by persons who have known the applicant for many years. When the applicant applies for admission to the College, the registrar's office encloses a health blank with the application. The student is requested to report to his family doctor for a health examination. The doctor then forwards the filled-out form to the college doctor. The applicant notifies his high-school principal that he is applying for admission to the college and requests him to forward his transcript as well as a personal letter testifying as to the student's ability to do college work.

When these qualifications have been met, the applicant is sent a schedule notifying him that he is to appear for a speech test, a health interview, and two general interviews, one of which is with the chairman of the Industrial-Arts Department. The general interviews follow a specific form and cover such items as general appearance, use of oral English, manner and poise, voice, responsiveness, interest in the college program, vocational choice, and judicial attitude. These interviews are scored on a scale and an average of the two interviews determines the student's score. Those who have met the qualifications up to this point are requested to appear at a specified time and place to take the entrance examinations. This examination consists of a battery of five tests which covers reading, general science, American history, language, and mathematics.

Those individuals who are accepted as freshmen are given another battery of examinations before the end of the first semester. These tests include a psychological, a silent reading, a vocabulary, an adjustment inventory, and an interest test. These tests are used mainly for counseling purposes.

Selective admission does not end when the student enrolls at the college; in fact it is continuous throughout the four years. Those who reveal weaknesses either scholastically or otherwise may be requested to withdraw from the institution.

Student Guidance

The college has an elaborate guidance program for all students. The freshman who enters at the beginning of a semester is assigned to a counseling group. The assignment is usually to a group which is interested in a particular curriculum and is under the guidance of a staff member from the same department. The student usually remains with the same counselor for the four years. If, however, the student or professor feels that

Finding Teachers (*from page 15*)

a change to another counselor or group would be of advantage to the student, he may be transferred. A regularly scheduled hour for counseling is a part of the student's regular schedule. Group problems are frequently discussed. Individual problems, however, receive the major share of counseling time. The counselor makes two written reports on the student's problems and progress each year. These reports are filed in the personnel folder and are accessible to all faculty members on request. All counseling data are constantly under lock and key and are in charge of a person whose specific duty is to supervise and care for these records.

Occasionally a student rates high academically, but is not suited for teaching. This weakness is usually revealed in the junior year when students participate in the junior practicum. This experience consists of an eight-week period devoted to observation and participation in teaching under an industrial-arts teacher who has been selected from the nearby community because of his outstanding personality and ability to teach.

Staff members of the industrial-arts department of the college make periodic visits to observe students in their new situations. Consultations between college staff members and the cooperating industrial-arts teachers concerning the student's ability to teach usually reveal the strengths and weaknesses of the student. Should the student's experience be such that both supervisors agree that he should not enter the teaching profession, he is invited to a conference where his experience as a teacher is discussed. The conference members consist of the dean of instruction, the chairman of the college Industrial Arts Department, the cooperating teacher, and any other persons who may be of assistance in helping to evaluate and contribute to this important decision.

Provisional Certificates

Some states project selection of teachers beyond this point by issuing a teaching certificate which is good for a period of three years. If at the end of three years of teaching, the school administrator certifies as to the individual's ability to teach successfully, he is given a life certificate.

All of us should consider it our duty to recruit the finest possible teachers for our schools. The industrial-arts teachers of the nation, by the very nature of the program, have perhaps the finest

(*Continued on page 21*)

Cooperative Design Leads to Attractive Coffee Table Project

By D. W. Lewis

This article is an example of an effort to introduce good design into the planning of industrial-arts projects. It will be noted that the author was successful in bringing about a cooperative effort in which the parent, the pupils, and the teacher worked together in order to develop a project which was pleasing to all, and which satisfied an expressed desire on the part of an individual. The author teaches in the high school in Columbus, Indiana.

THE design for this modern, smooth lined coffee table was worked out from blackboard sketches in a class which was studying the principles of design. In its initial stages ideas were obtained from a lady who had expressed a desire for a coffee table. The lady wanted something in a light "whitish" or limed finish, like one she had seen in a store window, but, most of all, she wanted a table unlike any possessed by her friends. In response to the request, many sketches were prepared by both the teacher and the students. Finally this design evolved as the one which appealed to all. General agreement was achieved after full-size templates had been made on heavy brown paper and placed on a block to simulate the appearance of the finished table.

Slab-sawed oak was used for the top since its grain showed bold white shapes when the white lead filler was scraped off. Quarter-sawed oak was used for the shelf because it was less obvious, and because it was felt that it would not detract the viewer's eyes from the top to a second center of interest.

Functional design characterizes this table which was developed through cooperative class action.

The "schmoo-like" shape of the top and shelf are quite rhythmical; they are smooth, and informally balanced. The finish brings out the inherent decorative quality of the material used. And too, the shape is functional since it provides ample space for serving or for ash trays and casual tid-bits of food. At the same time magazines and newspapers are within easy reach, or may be concealed from obvious view. By making the shelf protrude from the top, magazines may be selected easily, indeed they beckon those on the couch to choose one for their pleasure.

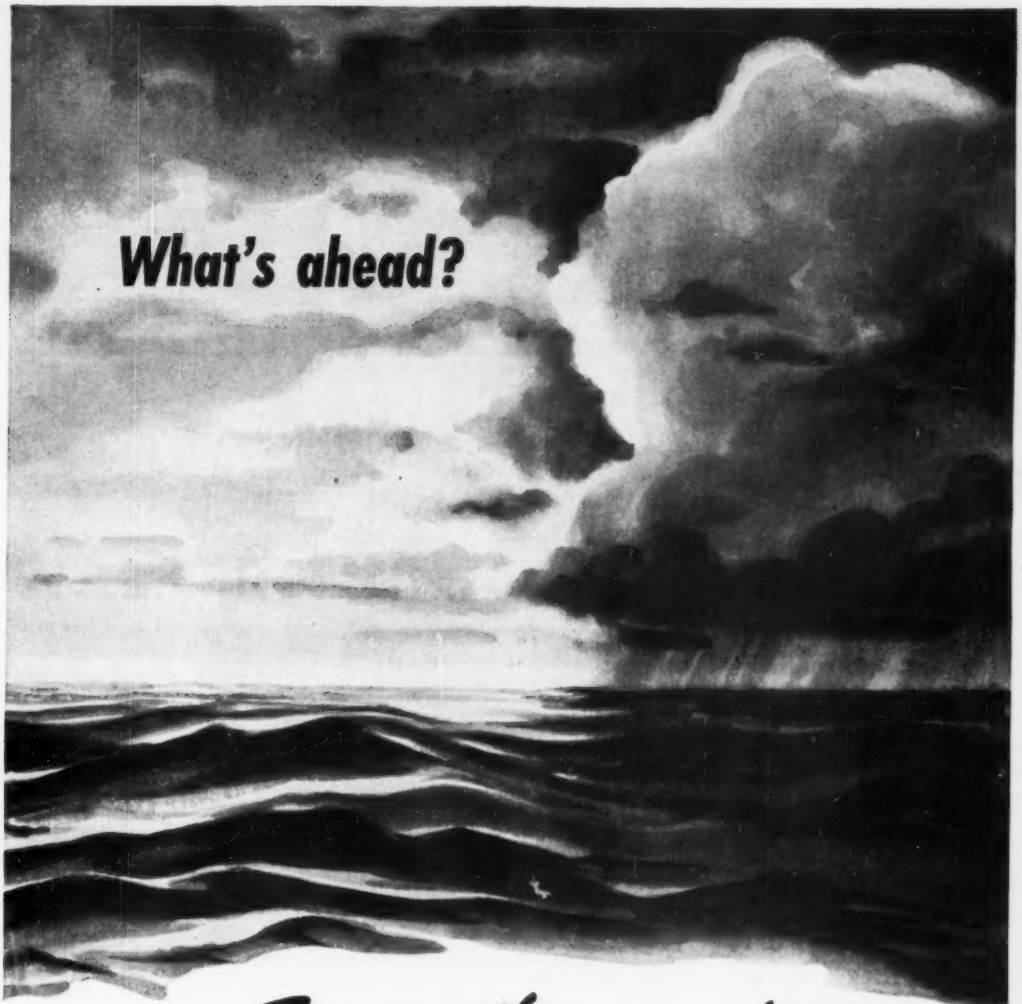
The legs are chrome-plated lavatory pipe from the local plumber's shop. Six galvanized floor flanges are used to secure the top and shelf to the legs. Holes were drilled in each flange for anchor screws.

The finish was produced by rubbing white lead into the grain of the wood after a light rub of linseed oil had brought out the golden color of the wood. After the white lead had set, it was scraped off, allowed to dry thoroughly, scraped lightly again, and then a sealer coat of thin shellac was applied. Both top and shelf were rubbed with 4-0 sandpaper, after which one coat of spar varnish was applied. This was rubbed to a sheen with very fine emery paper and light oil. Furniture polish finished the job.

The bottom of the legs, which touch the floor, may be finished by inserting wooden plugs in the ends of the pipe, and attaching steel cushion glides.

General Dimensions

Overall length	36"
Overall height	17½"
Height to first shelf	12"
Between shelf and top	4"
Maximum width	23½"



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I Saw THE THING!

By M. W. Knerr

This is a gruesome tale on a very timely topic. If you want to know the answer to that famous question, read about what was discovered by the Area Coordinator of Industrial Education for the Pennsylvania Department of Public Instruction, Harrisburg, who has the inside story.

AS I was walking down the street, I saw "THE THING," and it was horrible. It wasn't in a wooden box along a beach but rather in a container marked "Put Refuse Here." This is how I happened to see "THE THING":

After visiting an industrial-arts program in my area, I was walking to my automobile when a group of junior-high-school boys on their way home from school passed me singing, "Let's get rid of these awful things." All were waving something held in their hands. My curiosity was aroused so I followed the group to a street corner where a large refuse container was located. As each boy passed the container, he threw into it what he was waving around in his hand; all the time the group kept chanting, "Let's get rid of these awful things."

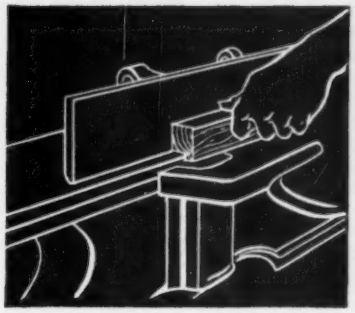
After the boys were well on their way home, I looked into the refuse can and "much to my surprise," I saw sheets and sheets of lettering—to be exact, "Vertical Single Stroke Commercial Gothic" lettering and sheets of mechanical drawings resembling a letter *E* laying on its back, while other drawings had a letter *H* in the center of the sheet surrounded by a border of squares and rectangles. So this was "THE THING!"

I couldn't help but contrast this experience with the one I had the previous week while visiting another industrial-arts program. In the shop I saw junior-high-school pupils interested and busily engaged in finishing projects they were about to take home for Christmas. There were wooden toys for a younger brother or sister, decorations for under the Christmas tree, hammered aluminum pin-up lamps in the shape of an anchor for a boy's room, well-designed and hammered brass and copper book ends, small electric motors, and center pieces to adorn mother's dining-room table during the Christmas holidays. The center pieces were made from the limbs of white birch, pine cones, and twigs of pine. Early in the fall the industrial-arts teacher had taken his pupils for a field trip to the mountain where they gathered the birch limbs and pine cones to be made later into the center pieces.

In Pennsylvania most schools schedule industrial arts in the junior-high school for two 50-minute periods per week. Why do industrial-arts teachers insist on taking from one-third to one-half the time allocated to industrial arts in the junior-high school to teach lettering, geometric construction, and formal mechanical drawing? Many teachers say, "Mechanical drawing is the language of industry, and for a boy to interpret the drawings used in the shop, they must understand orthographic projection." These teachers go even further and say, "A mechanical drawing is not complete unless the lettering is well done." I have visited industrial-arts shops in December where the pupils have done nothing since September but letter sheets of single-stroke commercial gothic or made a few horrible one-view drawings of the letter *E* or *H*. These pupils have not touched a hand tool nor have they had an opportunity to make or do useful things with industrial tools or materials. Is this industrial-arts education? Does this meet one or more of the objectives of industrial arts in the junior-high school?

I have visited hundreds of industrial-arts programs and have seen but few orthographic projection drawings used by the pupils in making mechanical-electrical things in the junior-high-school shops. I have seen pupils using teacher-made patterns, templates, and models from which they were constructing their projects. I have seen teacher-made wiring diagrams from which pupils were wiring bell circuits, and I have seen pupils using commercially-made full-size working drawings of woodworking projects. I have yet to see a pupil make from wood, metal, or other industrial materials the three-view orthographic drawings of blocks they made in mechanical drawing. Instead of teaching formal mechanical drawing and lettering in the junior-high schools, let us have the pupils make a plan of the mechanical-electrical things they will construct in the industrial-arts shops. This plan would consist of a freehand sketch, a list of materials to be used, and a listing of the proposed steps the pupil intends to follow in making the project. All this may be done in a small area called a "Planning Area" right in the shop. In some shops the planning area is a small glass-enclosed room within the shop where a few pupils may go to prepare their plans while others will be working in the shop on their projects, all under the supervision of the same teacher.

"Get out of here with that awful thing," formal drawing and lettering in junior-high school, "and don't come back no more."



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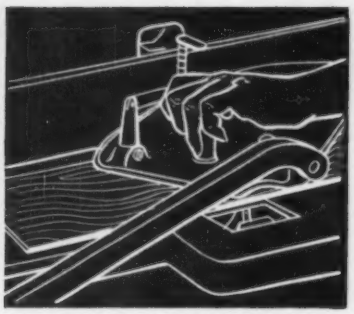

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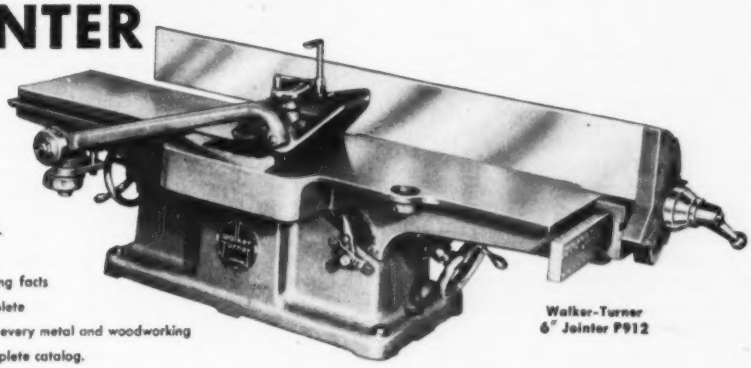

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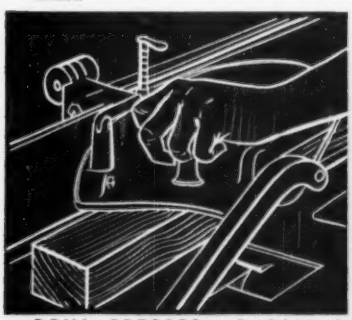

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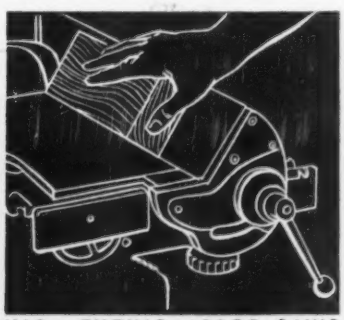

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Hysteresis in One Easy Lesson

By Hugh Lineback

Here is a demonstration utilizing the oscilloscope which will help students comprehend the mysteries of magnetic lag or hysteresis. The author is assistant professor in the School of Technical Training, Oklahoma A and M College, Stillwater.

ORDINARILY the student technician doesn't need to bother about the design problems connected with the parts he uses, but an acquaintance with the theoretical factors is valuable in selecting parts and diagnosing troubles. For example, in the manufacture of magnetic devices the effect of hysteresis (pronounced "hister-EE-sis") is an important consideration, but about all there is for the user to do is simply to realize the operating limits which result. To aid in understanding magnetic lag—which is just what the word hysteresis means—the oscilloscope connections described here may be used to provide a very practical demonstration.

Most students gain a concept of magnetic lines with little difficulty, but many are troubled by the units of measurement and their significance. The appeal of this demonstration to the trainee greatly aids in teaching magnetism. He can be assured that if he is well "squared away" on these principles he will have a good understanding of the entire field of magnetism from the technician's standpoint.

While detailed explanations may be found in electrical textbooks, a brief review of magnetic units will serve to interpret the oscilloscope patterns. The unit of magnetizing force which produces a certain magnetic field in a cubic centimeter of material is the Oersted (*H*), and the resulting magnetic lines are measured in Gausses (*B*). A typical curve showing the relationship of these units is given in Figure 1. Notice that

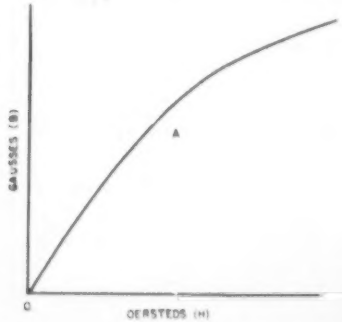


Figure 1

as the force is increased along the horizontal axis the resulting field shown by the vertical scale increases uniformly until saturation is reached in the region of *A*. The straight portion of this graph is analogous to a plot of the current in an electric circuit which results when various voltages are impressed across a fixed resistance. The magnetic field may be compared to current and the magnetic pressure to voltage.

The changing values of alternating-current signals produce a more complex figure than this simple graph. Everyone knows that magnetic substances will retain magnetism—some more than others—after the magnetizing force has been removed, so it is not surprising that an opposing force is necessary to bring the field strength of the magnetic material back to zero. Figure 2 shows how the magnetic intensity (*B*) drops off as the force (*H*) is reduced. Here the line *OA* is the same as in Figure 1. The field

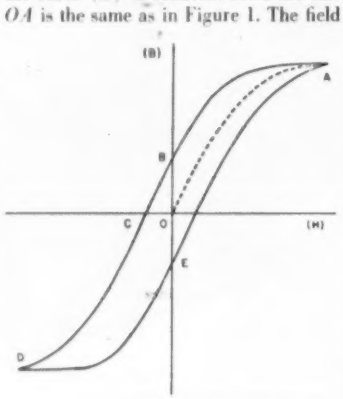


Figure 2

remaining when *H* is zero is called the remanence and is given by *OB*. The pressure necessary to cancel this magnetism is given by *OC*, and is called coercive force.

Making *H* greater in this negative direction will reverse the field and bring it to point *D* on the curve. Bringing *H* to zero again will cause the field to follow line *DE*. Thus it can be seen that an alternating-current magnetizing force causes a field which follows *OA* only at the very start, and then varies along the path *ABCDEFA* for each cycle. This graph is known as a hysteresis loop, and its area is a direct indication of the wattage loss it causes. Imagine what the output of an amplifier tube would be like if its plate current followed grid voltage variations in this manner!

Such a problem does occur in magnetic recording equipment, which is the reason a carefully adjusted magnetic bias must be used. Most descriptions of wire and tape recorders make only a vague mention of this bias. The second reference at the end of this article is especially recommended for the technician, as it furnishes an easily understood discussion on this neglected subject.

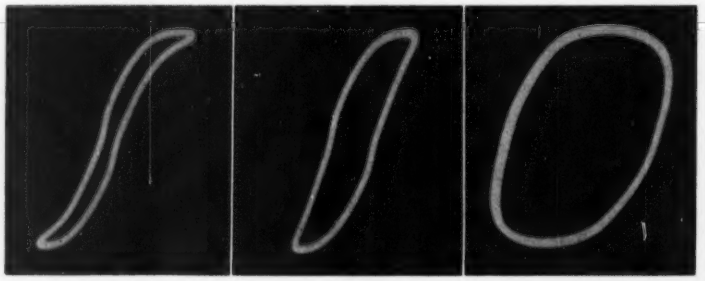
The circuit for producing this kind of pattern on the oscilloscope is given in Figure 3. R_1 should be only a few ohms, just to give a voltage proportional to the current which excites the field. The voltage across *C* will represent the magnetic flux if the product of R_2 in ohms and *C* in microfarads is approximately 20,000. This figure is for 60 cycles, and should be increased proportionately for higher frequencies. For this particular set up, 10,000 ohms was used for R_2 and a 4 microfarad oil-filled condenser for *C*.

In making the accompanying photographs, a cheap output transformer was used, with the rheostat across the secondary to vary the load. Figure 4 shows the hysteresis loop when the secondary

Figure 4—Hysteresis loop of unloaded transformer.

Figure 5—Increase in area of loop with load.

Figure 6—Exaggerated loop produced by short circuit.



is open circuited. The larger area within the loop of Figure 5 shows increased losses as the load resistance is decreased. An almost circular pattern results when the secondary is short circuited, as shown by Figure 6.

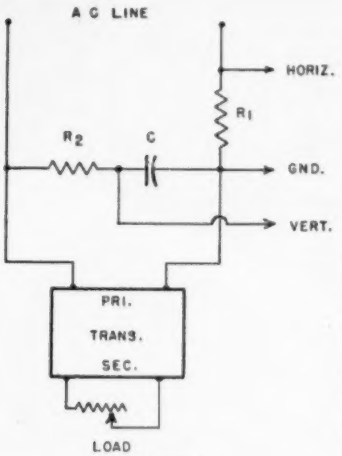


Figure 3

A down-to-earth example depending on these principles is watch demagnetization. It isn't enough simply to put the watch in an a.c. field and then turn off the switch. If the current, which causes the magnetism, happens to stop at the right point of the hysteresis curve, the timepiece may be left strongly magnetized. The proper procedure is to decrease the size of the hysteresis loop until the magnetic field becomes zero. This is easily accomplished just by moving the watch so as to increase the distance between it and the energizing coil.

Here is a simple experiment along this line which is quite effective. Improvise an electromagnet by inserting a piece of iron in a coil. Apply an alternating current and note that the iron will attract small nails. Switch the current off, and then repeat the procedure several times. Sometimes the nails will drop and at other times some will remain. The answer, of course, is hysteresis. While the principle is not difficult to understand, this little experiment illustrates it quite forcefully—and much more safely than using your watch for a demonstrator!

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16 Nails 10 Minutes Long!

A SCHOOL SHOP reader from Public School 93 in Brooklyn, N. Y., received the following note recently from an academic colleague:

Mr. Radom: May I please have some nails and a hammer? Miss ——.

Replied Mr. Radom by note:

Miss ——: About how long and how many?

Replied Miss ——.

Mr. Radom: Sixteen nails and about 10 minutes.

SCHOOL SHOP humbly suggests that the New York City Board of Education institute an in-service teacher-training program in tool literacy.

Teaching..... *from page 9*

"This is my shop and this is the way it should be." We lose sight of the fact that it should be the students' shop. It should meet *their* needs!

All of this takes an open mind. But it is demonstrably necessary for the shop teacher to be receptive to change. Study the better teachers you know. Compare their work with yours.

Finding Teachers.. *from page 16*

opportunity to become intimately acquainted with their pupils. Let us strive to recruit those individuals for the industrial-arts profession who we would choose to teach our own children.

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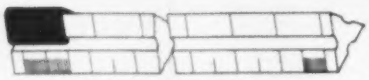
Dirty copper can be cleaned by using a solution of vinegar and salt. The proportions are not important. Wash the copper immediately afterward to prevent rapid oxidation.—*E. M. Woods, Enslow High School, Charleston, West Virginia*

Drawing-Scale Kink

The drawing shows an aid for eliminating a lot of waste time and patience in that it permits quick finding of the scale with which you have been working.

It is a small metal clip which is

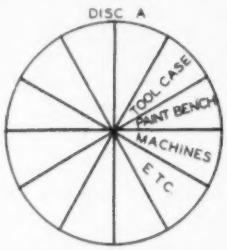


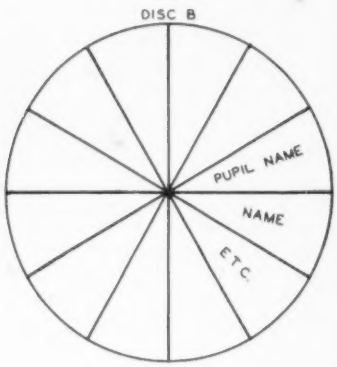
snapped over the upper edge of the triangular scale, at the left-hand side. This places the scale which is being used in a position touching the paper. By this means it is a simple matter to pick up the scale when required, bring the clip to the top left end, and, presto, the scale is in the proper position for using.—*F. N. Newton, Supervisor of Industrial Education, Sharon, Pennsylvania.*

Housekeeping Kink

The Pupil Detail Chart described here is a device to simplify the assignment of the duties involved in the tidying up of a shop at the end of a period. The chart plays no favorites as everyone in the class knows what has to be done, and who has to do it.

In order that each pupil may have an opportunity to assume responsibility for as many jobs as possible the chart is changed each week by moving disc *A*, which indicates the duties, one division.





Disc *B* is divided into the same number of spaces as there are pupils in the class, and a name is placed in each space.

Disc *A* is divided into the same number of spaces as disc *B*, and the duties entered on it, with one duty to a space.

Such an arrangement fixes definitely who is responsible for each job, and it insures that the work is distributed fairly among the members of the class.

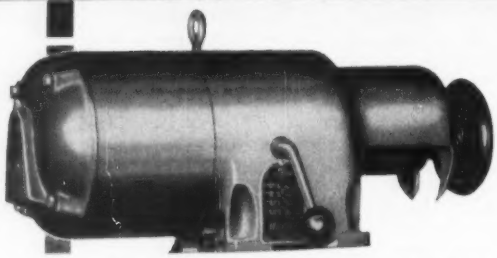
The discs may be made of cardboard or heavy drawing paper. Disc *A* is superimposed on disc *B*, and fastened together by passing a large thumbtack through the centers and into the bulletin board.—*Harold S. Beal, East Rochester Public School, East Rochester, New York.*

Blade Adjustment Kink

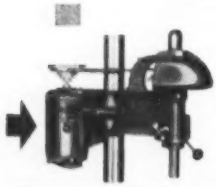
The following method of installing jointer knives is recommended as being simple and accurate.

Remove dull blades and clean all dust from the cutter head. Next set the rear

LIMA Selective Speed GEARSHIFT DRIVES



There is a LIMA GEARSHIFT DRIVE for every type of machinery motorization problem requiring selective-speeds up to 25 HP. LIMA GEARSHIFT DRIVES are available with integrally mounted motors or, in motorless types as your application requires. If you have a drive problem requiring the flexibility of selective-speeds, consult LIMA Engineers—they will be glad to assist you—there is no charge for Engineering Consultation.



Many original equipment applications such as the Buffalo No. 18 Drilling Machine shown are being supplied with Selective-Speed Lima Gearshift Drives as an integral part of the equipment. Using a Lima Drive, the Buffalo No. 18 Drill offers twenty optional spindle speeds.

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The Balanced Line

MEMO to: Shop Instructors
SUBJECT: Safety

Safety is something almost all shop instructors talk about Everyone is in favor of it. But getting a good shop safety program working is another matter Time, place and suitable examples, seldom all click together.

You can talk yourself hoarse - but if you can't illustrate your point effectively at the psychological moment - it will be lost on many students.

Suppose you let your students work while you wait to spot an example that you can use to teach safety rules. What happens? You must pull all the students away from their projects. Attention is divided, the practice of skills is interrupted, and time required to start them on their projects again is lost.

What's the answer? Here is one solution many shop instructors have found easy and effective. Using eight Basic Shop Safety slidefilms as the keystone of their safety program, these instructors promote safe shop practices among students through clear explanations immediately visualized by effective illustrations. Provisions for review and group participation are provided through discussion questions. Why don't you look over the Basic Shop Safety slidefilms to see how they can help you? Just write -

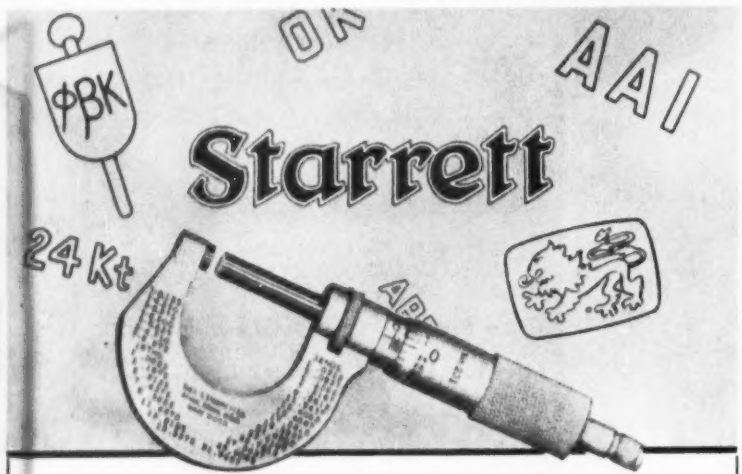
The JAM HANDY Organization
2821 East Grand Blvd.
Detroit 11, Michigan

table at operating height, and place a horse-shoe magnet on this table, protruding out over the cutter head. Insert the new knife in the head, touching the magnet, and tighten the screws. Proceed as above for other knives.—*M. M. Pittman, Leverett's Chapel High School, Overton, Texas.*

Jointing Kink

When joining two boards together by means of dowels, some difficulty is encountered occasionally in locating accurately the centers for the dowel holes. This difficulty may be overcome by driving a fine brad part way into the edge of one board at each point where a dowel is to be located. The heads of the brads should then be clipped off, leaving the ends extending about 1/16″.

The edge of the second board should then be placed over the points of the brads, with the faces of the two boards flush with one another. When the boards are in the proper position in relation to one another, the upper board should be tapped lightly on top, which causes the tips of the brads to leave center marks exactly opposite the positions of the brads. When the brads are removed you will then have center marks for your auger bit which are perfectly matched on the two boards.—*Charles Reich, Public School 130, Manhattan, New York 13, New York.*



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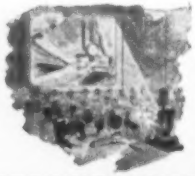

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Saw-Cleaning Kink

How to clean burned saw blades:

1. Wet the saw blade.
2. Sprinkle lye or Saniflush on the blade and let it set for three or four minutes.
3. Rub well with a swab.
4. Rinse off and dry.
5. Oil or wax the blade.

Caution: Handle lye or Saniflush carefully—keep away from hands, face, and clothing.—*David F. Groves, Assistant State Supervisor, T & I Education, Charleston, West Virginia.*

Blueprint Correction Kink

Occasions arise frequently when it becomes necessary to change the dimensions on a blueprint. This can be done conveniently by using a solution of common baking soda—½ teaspoon of baking soda to 2 ounces of water.

The corrections can be made by using an ordinary pen point. The bottle in which the liquid is kept should be kept closed tightly, and it should be well shaken before the contents are used.—*Ralph P. Madeley, Park Boulevard, Oakland 2, California.*

Aluminum Etching Solution

Here is a good aluminum etching solution but care must be exercised in its use because of the acid: 2 oz. HCl, 8 oz. H_2O, and ½ teaspoon $CuSO_4$ crystals.—*J. C. McClung, Lincoln Junior High School, Charleston, West Virginia.*

Bandsaw Kinks

For those who do not have access to an automatic filing machine to sharpen their narrow band saw blades, much time can be saved by folding the blade in three folds and filing three teeth at a time.

If narrow bandsaw blades are to be brazed by heating with a blow torch, a paper clip or two slipped over the spliced ends will be effective in holding them together.—*C. W. Cecil, Enslow High School, Charleston, West Virginia.*

Glue Pot Kink

It is a simple matter to know whether or not the glue pot is heating if a light socket and a toggle switch are attached in series to the electrical outlet. When the light is burning, the pot is heating. A flip of the switch, out goes the light, and the pot is cooling.—*A. C. Orsillo, Huntington Central High School, Charleston, West Virginia.*

SEND in your teaching kinks for publication in this popular SCHOOL SHOP feature.

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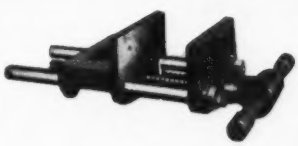

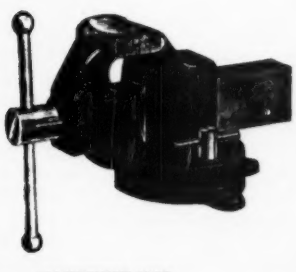

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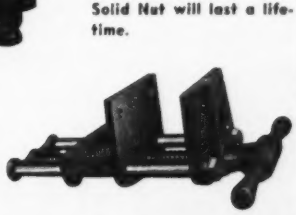

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DESIGN DETAILS

Capacity: Rectangular, 3½" x 6⅝"; Rounds, 3½" diameter.

Blade: Size—½"x.025"x5' **Motor:** 1/6 HP, Ball Bearing—foot mounting.

Speeds: Selective (belt change) 54, 100, 190 f.p.m. **Drive:** "V" Belt.

Vise: Quick action.

Blade Guides: Stationary brackets with adjustable blade guides.

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Diamond Dust

Abrasive comments from that doughty Scot, Tom Diamond, former head, Department of Vocational Education, University of Michigan, Ann Arbor.

Have You Ever Seen a Goat's Nest?

THE goat is a domestic animal. It consumes with equal relish tin cans and decayed vegetable matter, and views the world with a supercilious air which would do credit to the most aristocratic descendant of our Pilgrim Fathers. His personal habits are simple since he careth not where he liveth nor where he lieth down, and his housekeeping habits leave much to be desired. For these, and sundry other reasons, the term "Goat's Nest" has come to signify a place in which there is a complete lack of cleanliness and orderly procedure.

And we have Goats' Nests in some of our school shops. You don't believe it? Why, just look around you as you visit your fellow teachers. You will find teachers who are meticulous in their housekeeping. Of these we are proud. On the other hand, every once in a while, you will recognize the characteristics of the goat impressing themselves on you from every corner.

You may have noted the boxes of pied type which decorate the remote corners of some print shops. It is true that the teacher intends to have it distributed some day but, in the meantime, it grows and grows and grows. Finally, in utter desperation, the teacher returns to school one dark night and collects the offending type, transports it into the middle of the next county, and drops it secretly over the edge of the local Grand Canyon.

We had not planned on the trip to the Canyon, so we must return to the topic which, at the moment, is the nesting habits of the domestic goat, and their relation to the school shop.

We feel sure you have visited shops where the idea of a tool board, or tool room, is yet unknown. Some tools may be seen decorating the tops of the lockers, others have found a resting place beneath the benches, and the exact location of still others is a mystery to both teacher and students. This condition would appear to be disturbing, but the teacher is one of those calm individuals who takes things as they come, and who can be stimulated only by a good swift kick on that part of his anatomy which nature has provided for that purpose.

The absence of an orderly method of keeping the necessary hand tools is bad but, when the facilities for caring for them are present and obviously are not used, conditions seem to be worse.

Then there are the rows of drawers which someone has thoughtfully provided for brads, nails, screws, etc. Each one is carefully labeled in order that the student may readily know where to get what. As one enters the shop this piece of equipment is most impressive, but have you ever looked into one of the drawers? Try it some day! If you can read, it will be a simple matter to discover where the 1" brads are supposed to be kept. However, when you open the drawer, you must not be too surprised if, instead of brads, you find a few bolts and a heterogeneous mixture of washers.

If this does not annoy you, it may be of interest to examine the drawers in the benches. You will be amazed at what can be found in them, and you will be filled with admiration at the ingenuity displayed by the boys when it comes to the collection of junk. The teacher is proud of the fact that each bench is equipped with four drawers, and he waxes enthusiastic over the fact that each student has a drawer of his own. Does he open one of them to show you how

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Instruments in the Weston Model 901 matched group are self shielded against external magnetic fields . . . are accurate within ½ of 1% . . . tolerate wide fluctuations in temperature. They are available as d-c voltmeters, ammeters, milliammeters or microammeters; as a-c rectifier type voltmeters; and as a-c voltmeters, ammeters, milliammeters. Further details are given in Circular A-22-B, available through your Weston Representative—or from Weston Electrical Instrument Corporation, 633 Frelinghuysen Avenue, Newark 5, New Jersey . . . makers of Weston and Tagliabue instruments.

WESTON Instruments

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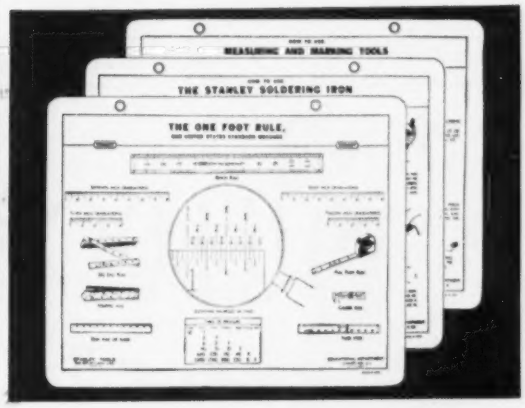
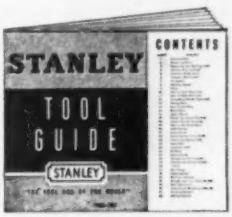
38 CHARTS — 27½" x 20½"



If you have used Stanley Instruction Charts in your classes, you know they're a big help in teaching proper tool care and use. And now for the first time in almost ten years these charts are available again in a *new* large size. They have been fully revised, with six new ones added. 38 charts in all — they give all the important tool facts for common woodworking and several metal-working tools. And the extra large size, 27½" x 20½", makes it easy for a large group to read them. Sold at cost, $5.50 a set, delivered anywhere in the U. S. In Canada, $8.50 postpaid.

STANLEY TOOL GUIDE
(Revised Edition)

For your students, Stanley offers the Revised Edition of the Tool Guide. Pages carry the same material as the large charts described above—38 in all—and are perforated and punched for 3-ring notebooks. Single copies are $.25 in the U. S. Ten or more, $.15 each. In Canada, 25c each. Prices cover postage.



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Name .....

Subject you teach .....

School .....

City ..... Zone No. ..... State .....

neatly everything is arranged? He does not! He knows that in all probability a young goat has nested therein.

Most teachers are conscious of the need for teaching safe practices in their shops. In order to aid them in developing safe habits they usually provide all the safety devices recommended by the manufacturers. They are to be commended for this but, unfortunately, we find cases where those devices which are not fastened to the machine lie around on the floor. This creates additional hazards for everyone in the shop. Not only so but, in addition, they contribute to the general confusion which characterizes the whole department.

But the prize exhibit is the nest of the old mama goat. We refer to the teacher's desk, or office if he happens to have one. When it comes to confusion, the students are pikers when compared to the person who, presumably, should set a good example. Drawings, papers, and magazines are piled two feet high. Completed projects, parts of projects, and unfinished projects litter the few square inches available. If there is any space left one is likely to find a few drills or special tools sandwiched in between the projects and papers. Truly it is a beautiful example of confusion which serves as a model for a group of young folks who are supposed to be learning by doing.

Other illustrations might be presented, but the few included here should give a general idea of what is considered to be poor practice.

It is recognized that most school shops are models of good housekeeping, but the few in which conditions such as these exist should be eliminated to the end that better work may be done more easily and that the young people who come to us may learn the importance of neatness in work of any kind.

Who wants to live in a Goat's Nest?

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Write for the **SHELDON** *Catalog showing and describing (with complete specifications) the line of* **SHELDON** *Precision Lathes (9", 10", 11" and 13" swing), Sheldon Milling Machines, Sheldon Shapers and Sheldon Machine Tool accessories and attachments.*

THESE 3 quality machine tools are especially adapted to school use because of their:

AMPLE SIZE—permits wide range of practical projects.

STANDARD DESIGN—true industrial tools with standard controls.

PERMANENT ACCURACY—these tools hold their accuracy under student abuse, do not require constant rebuilding and servicing.

SAFETY—all drives completely enclosed; all speed changes made by external levers.

PRICE—these are moderate priced tools that school shops can afford.

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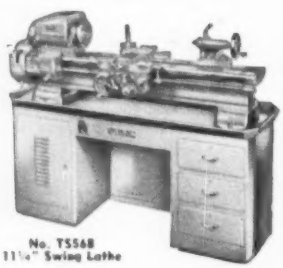
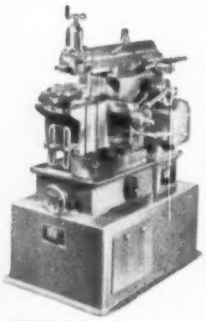
Horizontal Milling Machine


No. TS56B 11¼" Swing Lathe


12" Back-geared Shaper

HARRY C. SCHMID, state director of vocational education for Minnesota, was elected president of the National Association of State Directors of Vocational Education at the Miami meeting in December. HARRY T. HALSTEAD, Washington, was elected vice-president, and MARION ADAMS, Arkansas, secretary. . . . DEVO B. FOX, director of practical arts and vocational education, Western Michigan College of Education, Kalamazoo, died on December 11 at 54 years of age. . . . URWIN U. ROWNTREE, formerly of Pennsylvania, has been appointed teacher trainer, State Department of Vocational Education, Hartford, Conn. . . . JESSE RATHBON, a teacher in the San Francisco, Calif., schools for many years, has been named coordinator of industrial arts for the public schools of San Francisco. . . . LEONARD H. SCOTT, director of the Gloucester, Mass., Vocational School, has been appointed director of the Westfield, Mass., Trade School. . . . JAMES M. SNYDER, teacher trainer at the University of Cincinnati, has been named director of industrial arts and vocational education, Hamilton, Ohio. . . . HOWARD T. BATCHELDER of the University of Indiana has been appointed consultant on text-films in education for the McGraw-Hill Book Co., Inc., New York City.

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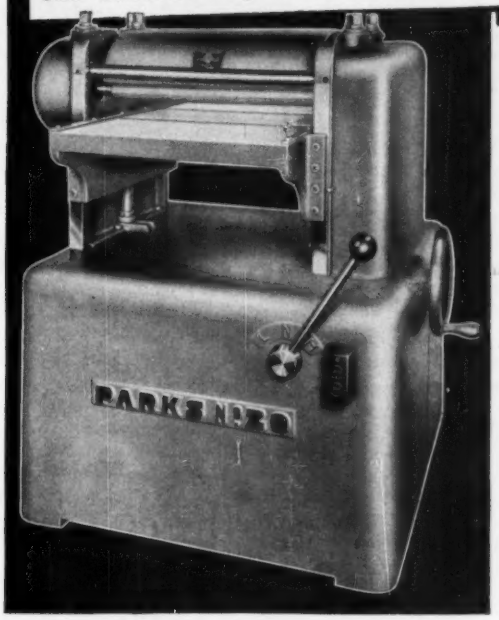

PARKS No. 20 20" PLANER

Here is a modernly designed, rugged, high-speed, low-priced planer that is ideally suited for every shop and industrial plant requiring a quality surfacer. The Parks No. 20 Planer has a four-knife cutterhead with a speed of 3600 R.P.M. and offers two feed speeds—20 and 40 F.P.M., and 40 and 80 F.P.M. Write for complete descriptive literature.

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A Very Little About Threaded Fasteners

And so we carefully draw our conclusions. . . . A bolt is a threaded fastener used with a nut for clamping metal to metal. A screw is a tapered threaded fastener used to clamp wood to wood. Everything is just lovely. The boys understand and education moves forward.

But wait a minute! Aren't there lag bolts for fastening wood to wood? Do we not have machine screws (used with nuts) for fastening metal to metals? Our beautiful generalization is ready for the ashcan. Now a screw is a bolt and a bolt is a screw.

It is altogether possible that somebody some day will come up with a definition that will hold water—without exceptions. However, until that fulsome day when the engineers convene to make a bolt a bolt and not a screw and a screw a screw and not a bolt, we'll find it necessary to by-pass definitions of threaded fasteners, hoping that the boys will understand that all is not perfect in the industrial world.—*Eduard G. Senkewitz, Fifth Avenue High School, Pittsburgh, Pa.*

Claude Joins Delta Power Tool Division

John Claude

John Claude has been appointed a special representative to contact the school market for Delta Power Tool Division, Rockwell Manufacturing Company, Milwaukee, Wis.

A Marquette University graduate, Mr. Claude spent 26 years with the Bruce Publishing Company selling their texts relating to industrial arts and trade and vocational education. He later on organized the John Claude & Associates serving schools throughout the country in an advisory capacity on school shop planning. He is a member of national, regional, and state societies devoted to industrial-arts, trade, and vocational education.

Mr. Claude enjoys a wide acquaintance in the field of industrial arts and trade and vocational education and will contact the school field to help them in their shop planning and the best use of Delta, Multiplex, and Crescent tools.

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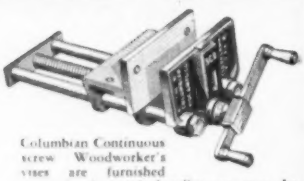
INDUSTRY'S FIRST CHOICE FOR OVER THIRTY YEARS



Columbian Continuous screw Woodworker's vises are furnished with hard wood handles—or may be equipped with ADJUSTABLE STEEL HANDLES, as above, to eliminate handle breakage, speed operation and provide extra leverage.

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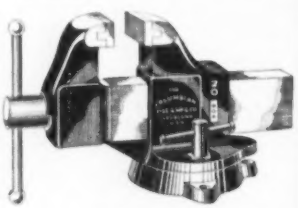

Columbian Machinist's Vises are made of malleable iron castings, guaranteed unbreakable, and designed to provide accurate, dependable equipment for school and industrial shops. All standard types.

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THE WORLD'S LARGEST MAKERS OF VISES

An Economical Precision-Built
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Ideal for Practical Instruction

Power or hand feed. Use on bench or pedestal

Send for complete information on various model Burke Milling Machines that are standard equipment in the newest, best school shops and laboratories. Also a complete line of vises and other accessories.

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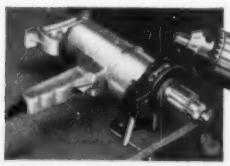
TRAIN YOUR STUDENTS with STANLEY Electric Drills

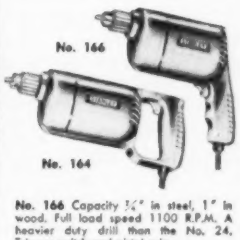
The right combination of strength and ruggedness, lightness and power, Stanley Electric Drills have many exclusive features for added safety and convenience. All Stanley Drills have three-jaw Jacobs chucks, heat-treated alloy steel gears and universal AC-DC motors for any standard voltage.

Send the coupon today for Catalog 68 showing complete line. Write Stanley Electric Tools, Educational Dept., 482 Myrtle St., New Britain, Conn.



No. 112 Capacity ½" in steel, 1½" in wood. Full load speed 225 R.P.M. Combination spade and breast plate handle. Offset chuck spindle permits drilling in close quarters without removing pipe or spade handles. Easily converted to drill press with No. 524 Stand, or may be used for horizontal work with No. 525 Stand.

No. 24 Capacity ¼" in steel, ½" in wood. Full load speed 560 R.P.M. A compact, sturdy drill ideal for light drilling. Oil-impregnated bronze bearings. Trigger-switch with locking device. Used with No. 514 Stand, makes economical drill press.



No. 166 Capacity ¼" in steel, 1" in wood. Full load speed 1100 R.P.M. A heavier duty drill than the No. 24. Trigger switch and pistol grip.

No. 164 Capacity ¼" in steel, 1" in wood. Essentially the same drill as the No. 166, with spade-type handle.

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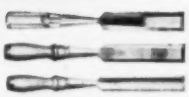
Tough, lasting fine cutting edges for all types of woodworking. Various types of socket butt and firmer chisels with "Hardwear" green plastic or hickory handles. Outside or inside bevel socket gouges. Short and full length turning tools.



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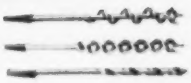
There's a GREENLEE for every need . . . all types of twists and heads. Accurately sized, perfect cutting edges. Line includes the famous "Greenlee 22" Solid-Center Auger Bits which come to you "Plastic Sealed" for factory-sharp edges.



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Fast, easy-boring Expansive Bits with free, positive chip clearance. Specially-designed wide, open throat assures smooth, uninterrupted action. In two styles — Setfast with quick adjusting-locking feature and Plain.

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GREENLEE Spiral Screw Drivers are sturdily constructed and have special phosphor bronze drive nuts for long, hard service. Beautifully finished, three sizes. Automatic Push Drills have completely enclosed working parts and phosphor bronze drive nuts. Handle holds eight points. Chromium plated.

The GREENLEE line also includes Bit Extensions, Razor-Blade Draw Knives, Ship Augers, Electricians' Bits, Hand Benders for Tubing, Radio Chassis Punches, Knockout Tools and many other timesaving tools for the shop worker and the student.

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Free Folder H-301 with complete data on GREENLEE hand tools for the woodworker. Write Greenlee Tool Co., Division of Greenlee Bros. & Co. 2042 Twelfth Street, Rockford, Illinois. U. S. A.

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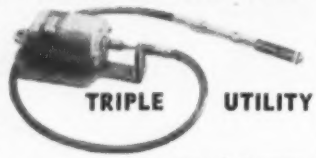
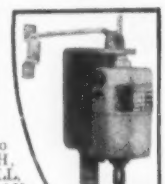
ON FOREDOM FLEXIBLE SHAFT MACHINES for TOP PERFORMANCE VERSATILITY and SPEED



Bench and Hang-Up Models, also models like Model 9050 illustrated which can be hung up, set on bench or mounted under bench. 5 Handpiece types, pencil-size or larger, all with quick-detachable feature. Extra good flexing qualities provide utmost freedom of movement in handpiece.

Model 9050
ONLY $29.60
COMPLETE with 6-STEP FOOT RHEOSTAT and PENCIL-SIZE HANDPIECE



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Use Foredoms to GRIND, POLISH, DRILL, ROUT, MILL, SAW, SLOT, CLEAN, SAND, ETCH, ENGRAVE, CARVE, etc., etc. In industry, they are profitably used in ALL THREE DEPARTMENTS—production, tooling, and maintenance. Ideal for the astounding new craft, internal carving of plastics.

Foredoms provide extra power and longer motor life because motor is not dwarfed to fit the hand. That is why they are the preferred type of small grinders among skilled craftsmen.

Foot rheostats are standard with most models. Prices start at $17.75 complete with universal motor. Also available is the FRESTO-FLEX for quick attachment to motors, electric drills and drill-presses priced at only $5.95.

Send for Catalog S-2738. It will give you valuable information on the many uses for Foredom Machines.

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News

HAPPENINGS IN INDUSTRIAL EDUCATION

New York Builds

As part of a $41 million building program of the State University of New York, a new industrial and technical building is now under construction at Farmingdale to be completed by the fall of 1952 at a cost of $2,344,404. This is to be a new unit of the Farmingdale Technical Institute. An addition is also being built to the Industrial Building at the Oswego State Teachers College. Costing over three-quarters of a million dollars, the addition will be completed by the opening of the fall term this year.

Education Index Listing

A NUMBER of readers of SCHOOL SHOP have shown an interest in having the publication indexed for reference purposes in the *Education Index*, published by the H. W. Wilson Co. This company indicates that the magazine will be included in the indexing service if requested by subscribers to the *Index*. Libraries are principal subscribers to the *Index* so it has been suggested that those interested in seeing SCHOOL SHOP listed have their librarians request such service from the H. W. Wilson Co.

California to Meet

THE 1951 spring convention of the California Industrial Education Association has been set for April 13 and 14 at Long Beach with "Safety" as the general theme. Wayne P. Hughes, director of the School and College Division of the National Safety Council will be the principal convention speaker. He will also act as a consultant to the various trade area meetings to be held.

Charters are being drawn up for each of the local chapters of the CIEA in an effort to solidify the state organization and to identify each of the chapters. Dale Walfron, director of adult and vocational education, Hayward High School, is the new state president.

Silversmithing Workshop

THE last of five annual national Silversmithing Workshop Conferences sponsored by Handy and Harman, refiners and fabricators of precious metals, will be held from July 30 through August 24 at the School for American Craftsmen of the Rochester, N.Y., Institute of Technology. Baron Erik Fleming, court silversmith to His Majesty, the King of Sweden, will conduct the conference. Applicants will be judged on their feeling for design in whatever medium they have worked and will be selected by a distinguished art jury.

Deadline for entries is April 1. Application forms may be secured from Handy and Harman, 82 Fulton St., New York 7, N.Y.

Northeastern Ohio Group Meets

Two programs have been held this year by the Northeastern Ohio Industrial Arts Association. Earlier in the year a successful luncheon program was held in connection with the meeting of the Northeastern Ohio Teachers Association while a shop-centered session was held at Ellet High School, Akron, on January 20. Displays and demonstrations of electricity in the shop program highlighted the meeting which included a luncheon in the new high school's cafeteria.

Officers this year are: president, J. H. Detrick, Parma; vice-president, J. C. Neff, Cleveland; secretary, M. J. Lerner, Ashland; and treasurer, C. E. Riley, Louisville.

Tennessee Group Convenes

THE Middle Tennessee Industrial Arts Round Table met in the new million dollar high school at Winchester, December 6, with another meeting scheduled for February 1 at Shelbyville. The group is composed of industrial-arts teachers from the area, faculty members of colleges, and juniors and seniors in teacher-training institutions. Demonstrations of internal carving of plastics, flocking, and use of molding powder will be given at the Shelbyville meeting.

Washington Organizing

INDUSTRIAL ARTS teachers in the State of Washington are organizing a statewide association. Regional meetings are being held to set up the organization.

CONVENTION CALENDAR 1951

New Jersey Vocational and Arts Association, March 15-17, Asbury Park, N. J.

Ohio Industrial Arts Association, Columbus, March 15-17.

Indiana Industrial Education Association, French Lick, March 29-31.

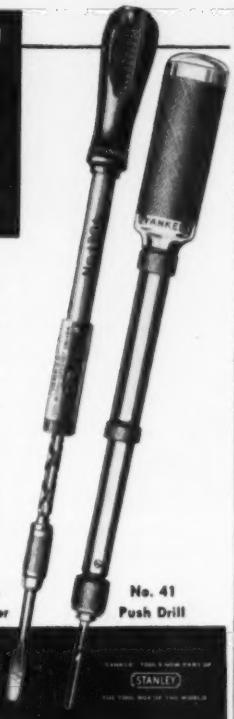
Illinois Vocational Association, April 5-7, 1951, Peoria.

Connecticut Industrial Arts Association, April 6-7, New Britain.

California Industrial Education Association, April 13-14, Long Beach.

Michigan Industrial Education Society, April 19-21, 1951, Grand Rapids.

"YANKEE"
Spiral Drivers & Push Drills
TEACH MOTION-SAVING



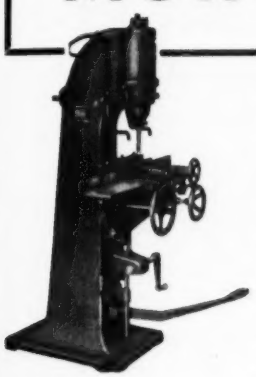
Help students do better work with fewer motions. Just a simple push with a "Yankee" Spiral Screw Driver spins the blade and drives the screw. No heavy wrist work! A flick of the shifter gives driving or drawing action, or sets spiral rigid. Pilot holes made easily with a "Yankee" Automatic Push Drill. Spring brings back handle after every push; reverse-spins drill point to clear out chips. Magazine handle holds 8 points, 1/16" to 11/64". Write for free "Yankee" Tool Book.

No. 130A Spiral Driver

No. 41 Push Drill

NORTH BROS. MFG. CO.
Philadelphia 33, Pa.

"OLIVER"
FOOT FEED, VERTICAL, HOLLOW CHISEL
MORTISER



- Universal Compound Table
- Quick Detachable Tools
- Double Pressure Foot Lever
- Rigid Non-Yielding Column
- Blower Fan Integral

This "Oliver" Mortiser is ideally suited to the work of school shops. Makes mortises neatly, quickly, accurately. Has new mortising head, ball bearing motor and ball bearing spindle. Quick return stroke. It is compact, sturdy, easily accessible. Has latest safety devices. Easy to operate.

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OLIVER MACHINERY COMPANY, GRAND RAPIDS 2, MICHIGAN

"Silver Steel"
SAWS...for EASIER TEACHING!

ATKINS NO. 65

Extra rugged for tough classroom use — and lots of it! Balanced taper ground polished blade. "Perfection" handle. Straight back, skip point. Cut-off 22, 24 and 26-in. lengths. Rip, 26-in. only.

● ATKINS CIRCULAR SAWS

Sturdy, tough—made to withstand the abuse of inexperienced operators. For all types of machines—rip, cut-off, mitre or combination.

● ATKINS NARROW BAND SAWS

Remarkable resistance to wear and breakage. Excellent for students! Tough, tempered, yet flexible. In all standard widths

ATKINS

As every instructor and experienced craftsman knows, the quality of any saw depends on the steel of which it is made. That's why Atkins *"Silver Steel"* saws are in such popular demand—they are made of the finest, toughest, longest-lasting steel ever perfected for sawing purposes! You'll find your students learn faster, turn out better work—make your job easier—when they use Atkins *"Silver Steel"* saws.

NEW School Shop Chart

ATKINS *"Silver Steel"* files in shapes and sizes for every filing requirement.

A boon to teachers — simplifies work, keeps students alert. Only $2.50 with your order for school shop equipment. Supply limited—order without delay to avoid disappointment.

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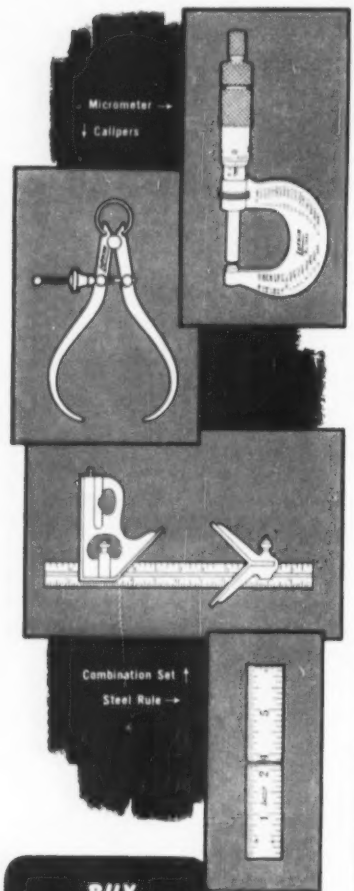
THERE IS AN ATKINS SAW FOR EVERY CLASSROOM USE

BETTER TOOLS MAKE TEACHING AND LEARNING EASIER!

Both your job, and your students' job can be made easier when you use genuine *Lufkin* precision tools. Recognized by American Industry for their exclusive features, precise construction, and built-in accuracy—*Lufkin* precision tools are being used in greater numbers of progressive school shops than ever before. When you buy—specify *Lufkin*. Write for valuable Precision Tool catalog.



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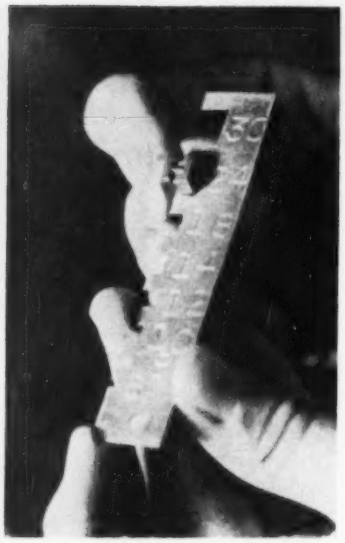


Note that the depth of the notches varies for type of different sizes. Numbers are stamped in.

Type-Size "Spotter"

By H. LeRoy Marlow

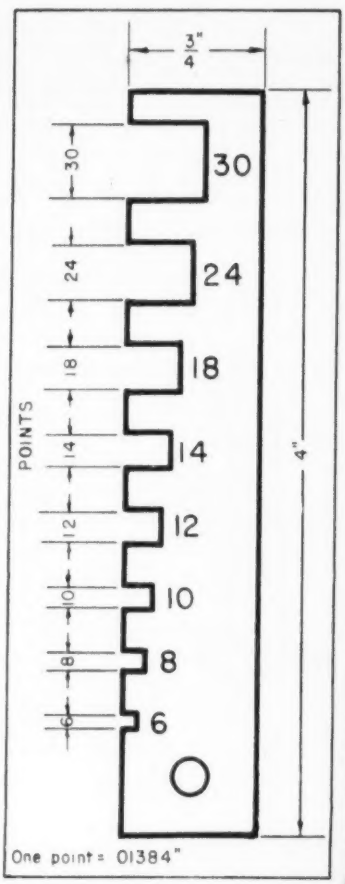
Here is a little project for the metal shop that will prove very useful in the graphic arts shop. H. LeRoy Marlow teaches in the Patterson Park High School, Baltimore, Maryland.

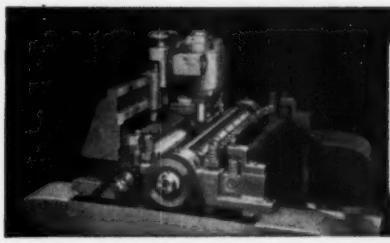
IF YOU have ever "inherited" an old print shop or a supply of pied type, you know what a job it can be to sort this so that it is usable. The problem is intensified when the conglomeration consists of many different point sizes. To a beginning student these various dimensions can present quite an obstacle, especially in the case where the numerical difference is slight—let us say, only a two-point difference.

Being confronted with a problem of this nature you will find that this little tool will aid in reaching a solution. As shown, the gage consists of one piece of (approximately) No. 18 gage metal, ¾" x 4". Along one side is cut a series of notches ranging from six to 30 points (a point equals .01384" or approximately 1/72") in size. The depth of these notches varies in order to make it convenient for the person using the gage—the six-point notch is not as deep as the eight or the eight point as deep as the 10, etc. To determine exactly the type size, hold the type in the left hand with the nick or nicks facing away. With the gage held as shown, try the various size openings until the type fits snugly into one of them. At this point you merely have to read the number stamped on the right of the gage to know the point size.

The gage could be made to vary from any size desired but by including the point sizes from six to thirty it will easily identify the more commonly-used type in the school shop. Any small piece of sheetmetal available could be used to make this timesaving device. Aluminum lends itself readily since it is easy to work and yet durable enough to last through years of service successfully. Care must be exercised in filing the notches in order that needed accuracy will be maintained. The numbers may be stamped in with a set of steel figures.

After the pied type has been separated by size it will of course, be necessary to identify it by its face.

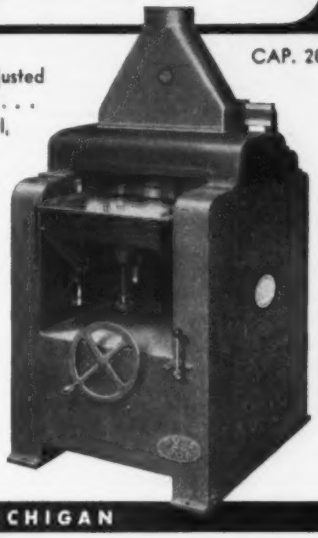




THE *IMPROVED* BUSS NO. 208

unquestionably the best machine for teaching standard wood planing practice

CAP. 20 x 8



Judge for yourself. It is the only planer in the low-cost field that is adjusted and operated similarly to the large standard machines used in industry . . . the only planer in this class that is equipped with a sectional infeed roll, sectional chipbreaker and four driven rolls — permitting the planing of pieces of varying thickness without the danger of kick-back. It's also the only small planer with in-built knife grinder and other big planer features. The grinder permits the instructor to grind the knives and joint them in just a few minutes. This saves much of his time and tends to eliminate the dull knife condition which so frequently prevents the student from doing good work. The frame is now a heavy one-piece semi-steel casting for great rigidity and strength. All driving mechanism and electrical wiring is fully enclosed, engineered for maximum safety. Judged from any angle the No. 208 is the best possible selection for the school shop and the price is well within the means of the average school budget. Write for the complete facts.

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Automotive Engines Maintenance and Repair. Frazee, Bedell, and Venk. Chicago, Ill.: American Technical Society, 1951. Pp. xiii+381. $4.50.

Developed through the medium of a four-year, industry-wide research project, this new book is not a "fix-it" or "service manual" type that gives only a limited number of common difficulties. Instead it is organized as a training plan designed to develop automotive technicians and specialists who can analyze the uncommon as well as the common difficulties. It does this through clear explanations, and an abundance of functional illustrations, so that procedures previously considered tricky are simply outlined. There is a reason for everything about the book—even the dust jacket, which, when unfolded becomes an attractive quick-reference wall chart.

Irving Frazee is Supervisor of the Publications Section of the Ford Motor Co.; Earl L. Bedell is the Divisional Director of Technical and Trade Schools and Vocational Education for the Detroit, Mich., Public Schools, and Professor of Industrial Education, Wayne Univ., Detroit; Ernest Venk is an instructor of automotive and aviation mechanics, Fordson High School, Dearborn, Mich.

Boats, Airplanes, and Kites. LaBerge. Peoria, Ill.: Chas. A. Bennett Co., Inc., 1950. Pp. 135. $2.50.

A new revision of a popular craft book. Every project has been thoroughly tested, and has proved to have strong appeal for boys of junior-high-school age.

The new revision is divided into three parts. Part I is devoted to model sailing yachts and motor boats; Part II presents model airplanes of different types; Part III covers tailless kites, war-kite, box-kite, and kite tournaments. There are detailed instructions and complete working drawings for every project, with photographs of projects in process and completed.

Armand J. LaBerge is an instructor of Industrial Arts, University of Minnesota and at Bryant Junior High School, Minneapolis, as well as supervisor of playgrounds, Minneapolis Park Board.

Carpentry Mathematics. Wilson and Rogers. New York: McGraw-Hill Book Co., Inc., 1949. Pp. xi+249. $2.20.

The revision of this popular textbook brings all the material up to date and offers improved clearness and modernization in terminology and style of writing. As before, the book's main objective is to give the student and carpentry apprentice a working knowledge of mathematics applied to carpentry work and covering every phase of the carpenter's job. This is achieved through the important teaching method of providing a simple, quick check-up on student's ability to handle problems; a review set-up for slow students; and carpentry problems geared directly to trade situations. The new second edition meets all requirements of carpentry apprentice training courses in all states.

J. Douglas Wilson is curriculum consultant, Vocational and Practical Arts Branch, Los Angeles City Schools, California; Clell M. Rogers is an instructor in Related Mathematics, Venice High School, Los Angeles, California.

Furniture You Can Build. Craftsman Editors. Chicago, Ill.: Popular Mechanics Co., 1950. Pp. 160. $3.00.

In order to get between the covers of this book, a project had to have two chief requirements—first, appeal and second, the quality of ease of construction. All of the 100 projects presented can be built by the craftsman or student with few tools and little experience. Each is presented with complete instructions, written so you can understand every step of the work. Each is accompanied by graphic illustrations and working diagrams drawn to exact scale.

This is the third of the Popular Mechanics Craftsman's Library series.

Blueprint Reading and Sketching. Lightle. Bloomington, Ill.: McKnight & McKnight, 1950. Pp. 71. $0.80.

This book offers a course in blueprint reading written especially for the beginning student. The drawings in most cases are actual problems rather than abstract exercises, and they are arranged from the simple to the complex. There is an opportunity presented for much practical experience in arithmetic, fractions in particular. Questions with each blueprint exercise lead toward quicker ability to read and understand the blueprint. An answer key accompanies the text.

R. Paul Lightle is an instructor at the James H. Smart School, Fort Wayne, Indiana.

TV and Other Receiving Antennas (Theory and Practice). Bailey. New York, N. Y.: John F. Rider Publisher, Inc., 1950. Pp. 606. $6.00.

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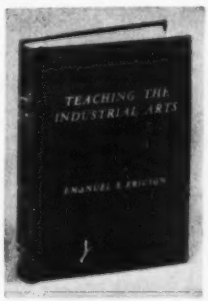

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Arnold B. Bailey is a designer and consultant on radiosonde equipment being manufactured for the United States Weather Bureau.

Applied Course for Student Printers. Clark. Peoria, Ill.: Chas. A. Bennett Co., Inc., 1950. $2.40.

This unique publication comes in loose-leaf form suitable for binding in a student notebook. It contains 95 worksheets which will cover a two- or three-year course. The problems are presented in progressing degrees of difficulty. The series is for the student who has a knowledge of the fundamentals of typesetting. A course outline and special information sheets are included.

Merle A. Clark teaches printing at the Garfield High School, Akron, Ohio.

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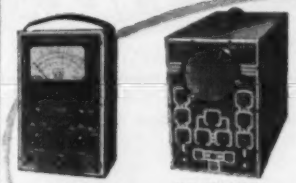

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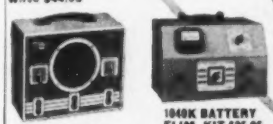

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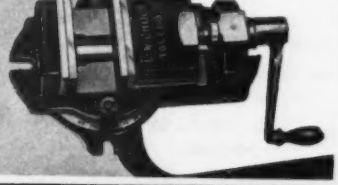

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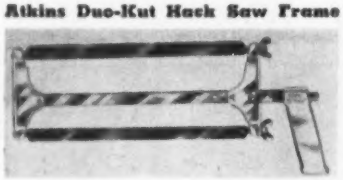

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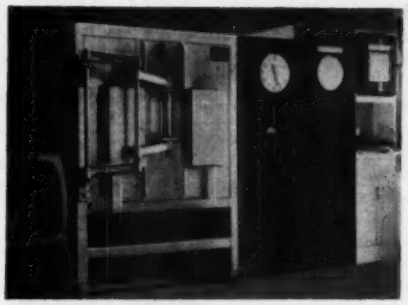

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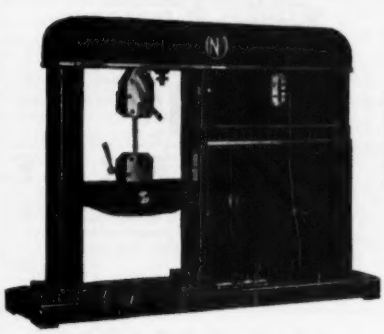

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counselling procedures. And they would be permitted to pursue their studies at institutions of their own choice to which they gain admittance.

Continuation of postponement of induction through successive years would be contingent on acceptable academic performance. At the undergraduate level, postponement, under the plan, would not be continued for a period longer than normally required to complete the first degree in the field in which the student is studying.

Meantime, school shop heads are requested by the agency to urge on all employers the most economical use of manpower possible in every field and every skill. "In the national interest, we cannot afford to permit the hoarding of talent," the agency points out.

Under the agency plan for deferment, there would be identified in each successive high-school graduating class, a quota of males otherwise eligible for induction who, on the basis of their probable future contribution to the nation's essential needs, would be permitted to pursue a college education prior to induction into the armed services. The quota fixed would be sufficient to provide a minimum supply of men trained in all fields essential to the national interest.

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A federal scholarship and loan program is being urged by the agency in connection with the deferment plan. Such a program, the agency feels, is essential to assure equality of access to

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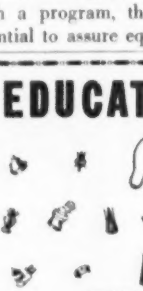

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education among all persons whose demonstrated ability qualifies them for postponement of induction for educational purposes.

82nd Congress Program.—By the time this is published, Congress is expected to have received the Administration's recommendations relating to education. If the recommendations have not yet reached Congress, they soon will. For these are the recommendations which have the backing—enthusiastic backing—of the Federal Security Administration.

FSA and U.S. Office of Education officials believe, firmly, that the grave international crisis underscored the four major goals which the Administration has previously recommended to Congress, and which will again be placed before the 82nd Congress. Briefly, these goals are:

1. Federal aid to elementary and secondary education.
2. Adequate school housing for all our children.
3. Federal aid in scholarships and loans for worthy and needy college students.
4. Strengthening of the federal government's facilities for assisting the schools.

So far as the first program is concerned, there are grave doubts that it will be received sympathetically by the new Congress. In fact, the Council of Chief State School Officers has lowered its sights and is concentrating on a teacher salary bill only. The National Education Association is still going for the full program, but there is ample evidence it will not adopt an "all or nothing" attitude and will be agreeable to a compromise.

Members of the House and Senate who a month ago were pessimistic about chances of a federal aid bill, believe a teacher salary bill might succeed in the 82nd Congress. In the first place, it will eliminate the elements which resulted in a bitter religious controversy. Secondly, while it will have the economy hurdle to overcome, pressure will be on the lawmakers to equalize teacher pay with rising living costs.

Scholarship legislation will run into the economy hurdle, as well as opposition on principle only. FSA and U.S. Office of Education officials point out, however, that with a program of selective service deferments for students in upper portions of their class only children of well-to-do parents will be deferred as they have the money to attend school, while capable children of poor parents—children of workers—must be drafted. As the session nears the 1952 election, this argument will have great appeal.

Steps have already been taken to strengthen the position of the Office of Education to serve and assist schools. The National Securities Resources Board has designated the U.S. Office as the coordinating agency for all defense training. The Division of Vocational Education has been named together with the Department of Labor to operate the program for training defense workers. Labor certifies the need; the division administers the training program through its usual channels. Further tasks will come later.

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Training Situation Clarified.—Latest word on federal policy regarding training under present conditions is contained in a memo, made public by the Federal Security Agency, from R. W. Gregory, Assistant Commissioner for Vocational Education, to all state directors of vocational education. The memo, officials said, was issued to clarify "misunderstandings" which had arisen.

Stressed was the point that until "such time as the Congress passes legislation appropriating funds for defense training," the relationship between the several agencies, as well as with employers, should continue as they have since the war-training programs of World War II were liquidated.

A cooperative program is being developed by the Department of Labor and the Federal Security Agency which will be effective when such funds are available, it was said. Meantime, regular training funds are being used to an increasing extent in supplying training that is needed to assure defense production.

Copies of the statement of policy were sent to all state employment services and representatives of the Bureau of Apprenticeship.

The statement said:

"This statement has been prepared jointly by the Bureau of Apprenticeship, the Bureau of Employment Security, and the United States Office of Education in order to clarify the situation with respect to training programs now in operation as related to national defense activities.

"Until such time as the Congress passes legislation appropriating federal funds for defense training, the relationships between the several agencies, as well as with employers, should continue as they have since the war-training programs of World War II were liquidated. However, it is recommended that vocational education authorities, institutions of higher learning, representatives of the Bureau of Apprenticeship, and the State Employment Services cooperate closely in determining the needs for various types of training which can be provided from existing facilities.

"The United States Department of Labor and the Federal Security Agency are currently developing a cooperative agreement between the two agencies which will be effective when federal defense-training funds are available, together with the appropriate rules, procedures, and forms to be used in that connection.

"Regular training funds are being used to an increasing extent in supplying training that is needed to assure defense production. In this connection, the Bureau of Employment Service offices should furnish to each of the above-mentioned training agencies all labor market supply-demand information, on a regular basis, which is pertinent to the planning of training needed in the defense effort."

Training Facilities Up.—Shop training facilities for emergency training of war workers are up about 10 percent as against those available in World War II, according to a spot check conducted by the Office of Education. A nation-wide survey is expected to show a similar general increase.

The check-up is being made by vocational education officials of the Education Office in order that they might have more exact information to present to Congress in justification of any further program of federal aid. While officials are leery of comment pending Congressional action, the activity in Washington indicates little doubt that such a program will be undertaken.

The spot check was conducted in the states of Alabama, Tennessee, Georgia, Virginia, Mississippi, North Carolina, Oklahoma, Texas, and Louisiana. Letters were sent to the state superviser of trade and industrial education of each state. Information was sought on two points: first, whether the training facilities were up to those available in 1944; and second, whether they exceeded those available in 1944, and to what extent.

Officials said that not a single state reported facilities below those of 1944. The increases reported, it was said, indicated an over-all increase of about 10 percent.

Shop Deferments Proposed.—School shop students who show outstanding ability would be granted draft deferments under a plan advanced by the U.S. Office of Education, backed up by the Federal Security Agency.

The agency feels there should be no exemptions of students from military service, but that the time of induction should vary, with postponements being made for educational purposes in the national interest.

At the undergraduate level, according to the plan, students for whom induction is postponed would be permitted to undertake courses of study of their own choice, with the assistance of available guidance and occupational

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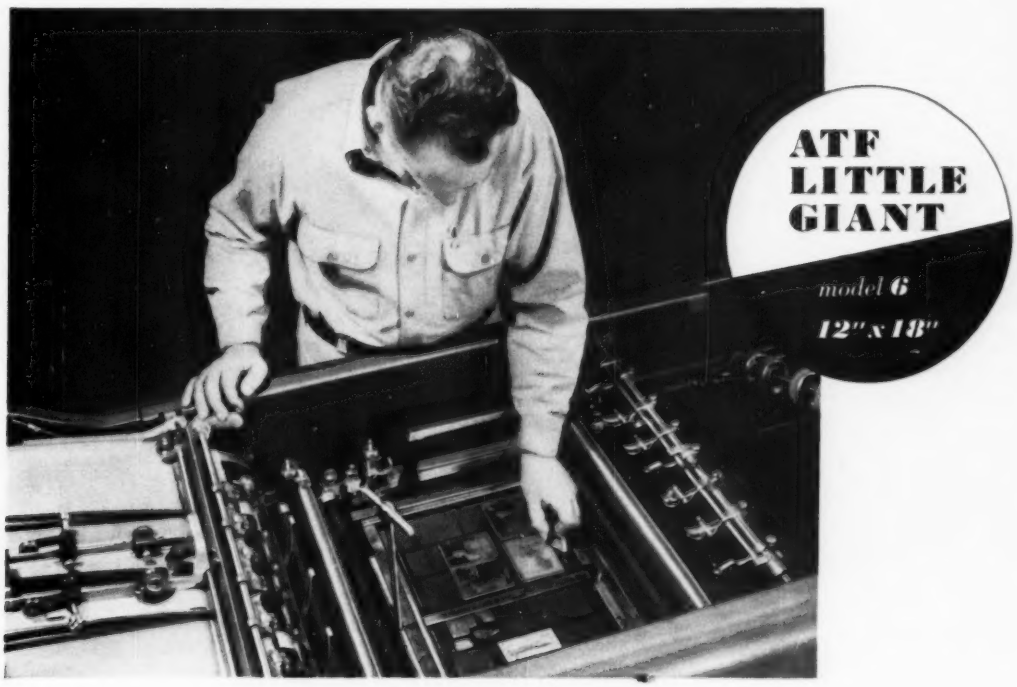

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